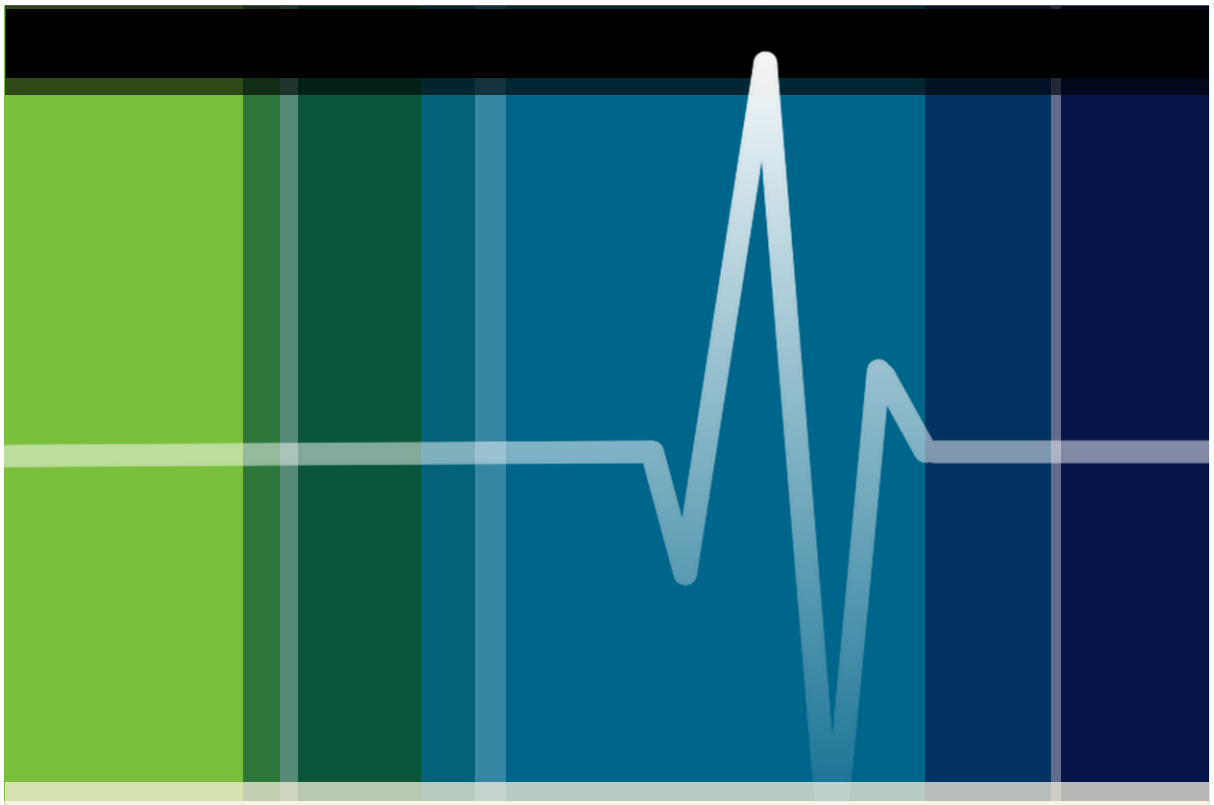

INTERIM M&E PROGRESS REPORT

Drought and Climate Adaptation Program (DCAP)

Coutts J&R / **May 2017**

COUTTS J&R
MANAGING AND EVALUATING CHANGE

Queensland Government

ACKNOWLEDGEMENTS

This report would not have been possible without the assistance of the project leaders and program leader Neil Cliffe. We also appreciate the time taken by informed persons and the steering committee members to talk about DCAP. Additionally, this report provided the opportunity to make an industry first benchmark of the climate change strategies of QLD/NT/WA producers and advisors. This would not have happened without those who completed the survey or the organisations who distributed the survey link through social media, websites, email and e-newsletters.

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May 2017

SUMMARY

To be completed for final report

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INTRODUCTION

Background

The Drought and Climate Adaptation Program (DCAP) is a new initiative (2016/2017) of the Queensland Government's drought assistance package which continues the existing suite of programs currently in operation across government agencies. Initially funded for $3.5million over one year, the funding is split between the Department of Agriculture and Fisheries (DAF), the Department of Science, Information Technology and Innovation (DSITI) and the University of Southern Queensland (USQ). Other partners including Agri-Business Development Institute (ABDI) and Meat & Livestock Australia (MLA) are involved in other DCAP projects.

This funding is to help producers be more resilient and better able to manage their drought and climate risks and adapt to impacts of climate change. This will benefit the performance and long-term productivity of the sector and the Queensland economy.

DCAP has three platforms:

1. Help producers to be better prepared for risks such as drought.
2. Queensland Drought Mitigation Centre - partnership between DAF, USQ and DSITI to work with national and international climate modellers to improve seasonal forecasts for northern Australia and conduct other RD&E activities.
3. Programs to help Queensland agriculture adapt to future climate scenarios through improvements to regional climate change forecasts and practical, local adaptation strategies for our agricultural industries.

DCAP contributes to the Queensland Government's 2015 election promise to 'work concurrently with industry to develop a suite of measures that will assist producers to improve their climate risk management and drought preparedness strategies for the longer term'. The project also intends to *build more resilient businesses by helping beef and sheep producers make informed decisions to recover from the current drought and to better plan and manage for future droughts* - adopting new approaches to achieving practice change with a range of *other partners*. The program is planned to run from July 2016 to June 2021 with Phase 1 finishing June 2017.

Its objectives are:

- Increased scientific capacity and tools to monitor, predict, advise and plan for climate variability and impacts of climate change.
- Increased awareness, understanding, skills and capacity of industries and producers to make most effective use of tools and information supporting their management of drought, climate variability and adapt to climate change.
- Increased uptake and application by industry, producers and their advisors of available tools, information, practices and strategies to more effectively manage and be productive and profitable in the context of a variable climate.
- Industries and producers seeing clear benefits as a result of using tools and information and making practice changes.

There are 18 sub projects in the program managed between the University of Southern Queensland (USQ) and the Department of Science, Information Technology and Innovation (DSITI). These eleven USQ and seven DSITI projects sit under the Queensland Drought Mitigation Centre and are the focus of this evaluation. They include

Research projects

- DSITI 1 - Social research into barriers to adoption
- USQ 2 - Improving seasonal forecasts
- USQ 3.1 Modelling multi-year droughts
- DSITI 3.2 - Quantifying multi-year droughts
- USQ 6 - Enhanced multi-peril crop insurance
- USQ 15 - Economic value of SCF in agriculture
- DSITI 16 - Palaeoclimate data for water security

Development projects

- DSITI 4 - CC projections for ARM
- USQ 7.1 - Developing drought monitoring indices
- USQ 7.2 - Developing crop forecast models
- DSITI 8 - Pasture alerts
- USQ 9 - Developing and customising DS tools
- DSITI 10 - LongPaddock 2020/FORAGE/Agile PM
- USQ 14 - Crop production modelling under CC
- USQ 19 – EVI MODIS Predicting pasture production/drought

Extension projects

- USQ 5 - Regional CC adaptation for agriculture
- DAF 11 - Improving drought resilience in western Queensland grazing businesses
- DSITI 12 - Communicating CC impacts to agriculture
- USQ 13 - Revamping MFC workshops

DCAP also has three other partnered projects (not included in this evaluation) lead by DAF animal Science, Agri-Business Development Institute (ABDI) and MLA. These are:

- DAF 11 - Improving drought resilience in western Queensland grazing businesses (DAF)
- DAF 17 - Business mentoring for the grazing industry (ABDI)
- DAF 18 - Co-innovation R&D for Profit (MLA)

About the evaluation

It is considered essential that all the relevant activity, outputs and outcomes to demonstrate project success be captured through a systemic, robust and structured Monitoring, Evaluation and Reporting (MER) process. The MER resulting from Phase 1 is required to be compelling and supportive enough to demonstrate project success and will be used as the basis to develop Phase 2 which will further develop effective partnerships, networks and support services.

The outcomes of this evaluation will inform and guide future investment strategies for the Queensland Government. It will also improve the Government's capacity to support Queensland agricultural industries with improved drought resilience and management of climate variability and a changing climate.

Scope

The contracted M&E scope includes:

1. Establishing an online data capture system to capture workshop, survey, narrative and case study data collected by DCAP projects (customisation of YourData platform).
2. Developing feedback sheet and survey instruments/questionnaires for application by DCAP project staff.
3. Undertaking informed person surveys and interviews with DCAP project team members.
4. Undertaking benchmarking survey with consumers of DCAP project outputs.
5. Providing an M&E report (end of project report).

Approach

The M&E process

A scoping teleconference was held with Program Manager, Neil Cliffe, discussing all aspects of the M&E process, protocols and responsibilities. The M&E timeline was a key issue given its late start due to the tender process. In the tender document, Coutts J&R also noted that it has not had opportunity to work closely with the project leaders during Phase 1 in terms of the type and quality of data to collect. This could mean that there may be some gaps in data collected to date in terms of the first year's reporting against progress and impact.

Overall project logframe

An overall M&E Log Frame (see Appendix 3) was developed along with a project level M&E planning table (see Appendix 3). The table is an example of how to specify which methods project leaders could use in their project and when. The actual methods would depend on type of project, resources and time frame.

YourDATA online M&E Platform

YourDATA is a web-based application providing a central data collection point for projects. It allows team members to input raw data, view real-time graphical reports, and export collated data to spreadsheets, anytime and anywhere.

A BETA version of the DCAP M&E Database is online (http://yourdata.com.au/dcap). It currently includes a 'Feedback Sheets & Surveys' page and a demonstration of 'Extension Activities' page. New sections will be added over the coming months and the site will continue to be developed according to ongoing project M&E needs. This data will feed into individual project M&E reporting needs as well as informing outcomes for program objectives. At this stage, data available online includes:

- Climate Change Adaptation Workshops (Calliope, March 2017)
- Climate Change Adaptation Workshops (Ayr, May 2017)

- Benchmarking web survey (still live, started 16 May 2017, closing 9 June 2017)
- Engaged stakeholders survey (still underway)
- Project leader survey (completed 15 May 2017)

All the information collated through the different methods above have contributed to this report.

The database is setup so users (including project leaders) are assigned to specific projects and will only be shown relevant data (administrators can see all data from all projects). Project leaders will be given access to YourDATA in DCAP Phase 2.

DCAP project leader M&E instruments

For each of the subprojects, project leaders developed ideas for evaluation using the Coutts J&R Draft Concepts for M&E document (see Appendix 3), which was circulated when project implementation plans were being drafted.

As DCAP moves into Phase 2, Coutts J&R will support project leaders with developing feedback sheets and survey instruments as required. These will be uploaded to YourDATA where users will fill out responses to any evaluation activities allowing for real time viewing of data and also easy access and collation of results.

The key to M&E is to have clear and consistent required annual M&E reporting categories across all projects. Projects determine their own individual M&E activities and data management– with some guidance and assistance as needed so they can effectively report against these categories. Only key summary data as per the required categories would need to be provided to the overall program M&E.

Interviews with the project team

Each of the project leaders were interviewed about their projects. These interviews were designed to capture the project's progress, issues, learning, and observed impacts to date (See Appendix 4 for a list of questions). Those interviewed included:

- David Cobon
- Dr Ramona Dalla Pozza
- Fiona McCartney
- Roger Stone
- Shahbaz Mushtaq
- Christa Pudmenzky
- Louis Kouadio
- Jarrod Kath

Other information contributing towards understanding project progress to date included:

- DCAP dashboard V1 17012017
- DAF DCAP Quarterly Progress Report – March 2017 – DSITI
- DAF DCAP Quarterly Progress Report – March 2017 – USQ
- DAF DCAP Quarterly Progress Report – March 2017 – ABDI
- DAF DCAP Quarterly Progress Report – November 2016 – DSITI
- DAF DCAP Quarterly Progress Report – November 2016 – USQ
- Technical Reference Panel Teleconference minutes – 12 April 2017

Informed persons survey

It was proposed that interviews be undertaken with informed persons who have been directly engaged by the project/sub-projects to capture their views of the value of relevant project activities and outputs to date and their use/intended use of these – as well as what is needed into the future.

Project leaders nominated names of people who could participate as an informed person and then followed up to ensure they were happy to participate in an interview with Coutts J&R. To date, five interviews have been completed with the process still underway. It is anticipated that there will potentially be 10-12 completed interviews at the survey's close. The survey questions can be seen in Appendix 5.

Steering committee members will also be interviewed to gain further insights at the program level. The aim is to understand the program highlights to date, any challenges that have arisen and how they have been/are being addressed, and perspectives on Phase 2. The results of these interviews will be included in the final report.

Benchmarking web survey of producers and advisors

A broader web-survey of producers and advisors was designed to benchmark the current approaches to decision making and planning for climate variability (season to season; year to year) and to capture the state of understanding, availability and use of tools and information and issues being faced by the industry in relation to drought and climate risk mitigation. This is a cross industry first and will provide valuable information not only for DCAP but for the organisations who helped distribute the survey link (see below).

The questions were interactively developed with DCAP team members to ensure they were relevant and useful across the projects. The survey questions are in Appendix 2.

Various rural and agribusiness networks were approached initially by Neil Cliffe and then followed up by Coutts J&R to help with distributing the survey link through direct email, e-newsletters and social media. All were very cooperative and agreed to participate including:

- FutureBeef (social media, email distribution list)
- Leading Sheep (E-newsletter, social media)
- DAF communications (social media, website)
- Canegrowers (social media)
- Regional Canegrowers organisation (email list)
- Growcom (social media, E-newsletter)
- AgForce (social media, E-newsletter)
- Queensland Farmers Federation (social media, weekly E-newsletter)
- Other email distribution lists including: USQ Climate updates (Neil Cliffe email list);

There was some sharing of the social media posts (including five retweets of the QFF Twitter post) as well as instances of emails being forwarded by recipients to their respective networks. The survey began to be shared 16 May 2017 and will be live until 9 June 2017.

An overview of some interim quantitative findings is in the body of the report and Appendix 6. A full analysis will be included in the final report. These will be made available as a standalone report to those organisations who helped distribute the survey.

Technical Reference Panel

The DCAP Technical Reference Panel acts as critical friends for the program, providing independent, technical guidance and advice to DCAP program management and collaborating organisations (particularly DAF, DSITI and USQ) regarding development and implementation of DCAP RD&E projects. Panel members are not participants in any of the proposed DCAP projects.

Responsibilities and tasks of the panel include reviewing DCAP project proposals to:

- Provide elements of contemporary peer review of project objectives and methodologies;
- Provide suggestions which would improve project implementation processes;
- Provide suggestions on possible productive additional collaboration opportunities with other organisations, nationally or internationally;
- Identify other work, or existing products relevant to DCAP projects; and
- Identify potential leveraging opportunities which enhance and multiply DCAP investment.

The panel members are:

- Facilitator – Jeff Coutts (Coutts J&R, Toowoomba) (DCAP M&E service provider)
- Member – Mark Howden (ANU, Canberra)
- Member – Scott Power (BoM, Melbourne)
- Member – Graeme Anderson (DEDJTR, Geelong)

Technical Reference Panel Support staff

- Land Management Unit Director – Vern Rudwick (DAF, Brisbane)
- DCAP Program management – Neil Cliffe (DAF, Mackay)
- DCAP Program support – Damien O'Sullivan (DAF, Kingaroy)

Two to three meetings will be conducted per year, held at the convenience of panel members. Most meetings would be held by teleconference with the option to conduct face to face meetings if and when required.

The first meeting (teleconference) was held 12 April 2017. Participants were Jeff Coutts; Mark Howden; Graeme Anderson; and Neil Cliffe (Scott Power apology due to illness, later updated out of session). The agenda included the terms of reference for the panel's operation, DCAP 2 planning and project development and a general discussion. Panel members indicated that they were happy with the Terms of Reference and agreed to be involved. Since this meeting, panel members have been advised about processes for helping to review Phase 2 project proposals.

Reporting

This report covers Phase 1 of DCAP (2016/2017). Incorporating all the data sources discussed above, the findings below are mapped against the levels of the program logframe (Appendix 3). The levels are:

1. Longer term & Industry Impacts
2. End of Program Objectives
3. Communication & Extension
4. Products & Tools

5. Development Activities
6. Research Activities
7. Project Management

Moving into Phase 2 of DCAP, the intention is to provide an annual M&E report to coincide with program reporting requirements. A mid-term (6 monthly) report will provide an update on emerging themes and pinpoint any issues that may need addressing.

FINDINGS

1. Longer Term & Industry Impacts

More resilient and productive primary production able to better plan, adapt and manage drought and climate variability.

Indicators

DCAP's longer-term impact is ultimately tested through the *trends in rural industry performance over time in relation to previous performance – especially in the face of extended challenging conditions.* Indicators include: numbers of enterprises; productivity; profitability; social indicators; and environmental indicators. These will only become evident over time and require detailed analysis to take into account the many other factors that impact on industry viability.

There are a number of specific lead indicators however, that can measure impact on improved management for drought and climate variability and gains at the industry level. These include the changes over time with the numbers of producers and their advisers and the extent to which they have:

- A documented plan for managing a variable climate e.g. a drought plan;
- Confidence in being prepared to meet future climate variability, such as droughts or climate change;
- Confidence in having access to the resources/tools/information needed to effectively make planning decisions for climate variability;
- Effectively used tools/resources when planning (or assisting clients to plan) for climate variability;
- Reduced barriers preventing accessing relevant tools/resources and/or knowledge; and
- Applied the tools to key management practices used when planning for climate variability.

These indicators formed the basis of an extensive benchmarking survey currently being undertaken (closing 9 June 2017). Although the program may have had some influence in its first year, it would be expected to be minimal given that most of the projects were engaged in research and development activities. However, as project outputs are rolled out and the agricultural and grazing community are further engaged, there is an expectation that changes in these indicators should be evident.

Preliminary results of the benchmarking survey

The preliminary results of the benchmarking survey on these key indicators are shown below (data was current as of 29/5/17). A more detailed interim summary including graphs is located in Appendix 6.

Demographics

As of 29 May 2017 there were **215 valid responses** to the benchmarking survey, with 67% of respondents Producers and 33% Service Providers/Other - 89% of respondents were from Queensland. The main three industry combinations represented were:

- **Producer respondents (n=145):**
    - 68% Beef/Dairy/Sheep only
    - 13% Sugar/Cropping/Horticulture only
    - 11% Beef/Dairy/Sheep & Sugar/Cropping/Horticulture
- **Service Provider/Other respondents (n=70):**
    - 54% Beef/Dairy/Sheep only
    - 23% Beef/Dairy/Sheep & Sugar/Cropping/Horticulture
    - 13% Sugar/Cropping/Horticulture only

A documented plan for managing a variable climate - e.g. a drought plan

The majority of respondents (68%) did not have a documented plan (or process to use) for managing a variable climate, with 44% of total respondents indicating *decisions are made as needed*, 19% intending to have a documented plan in future, and 5% not believing it was necessary.

Confidence in being prepared to meet future climate variability, such as droughts or climate change

Overall, respondents were moderately confident in their preparedness to meet future climate variability (6.4 avg.), with Producers (6.4 avg.) slightly more confident than Service Provider/Others (6.1 avg.) were in their ability to advise clients on preparation.

(Note: Question was asked as 0-10 rating scale where 0=not at all confident and 10=highly confident)

Confidence in having access to the resources/tools/information needed to effectively make planning decisions for climate variability

Overall, respondents were moderately confident in the ability to access resources/tools/information needed to effectively make planning decisions for climate variability (6.1 avg.), with only a negligible difference between Producer (6.0 avg.) and Service Provider/Other (6.1 avg.) confidence.

(Note: Question was asked as 0-10 rating scale where 0=not at all confident and 10=highly confident

Effectively used tools/resources when planning (or assisting clients to plan) for climate variability

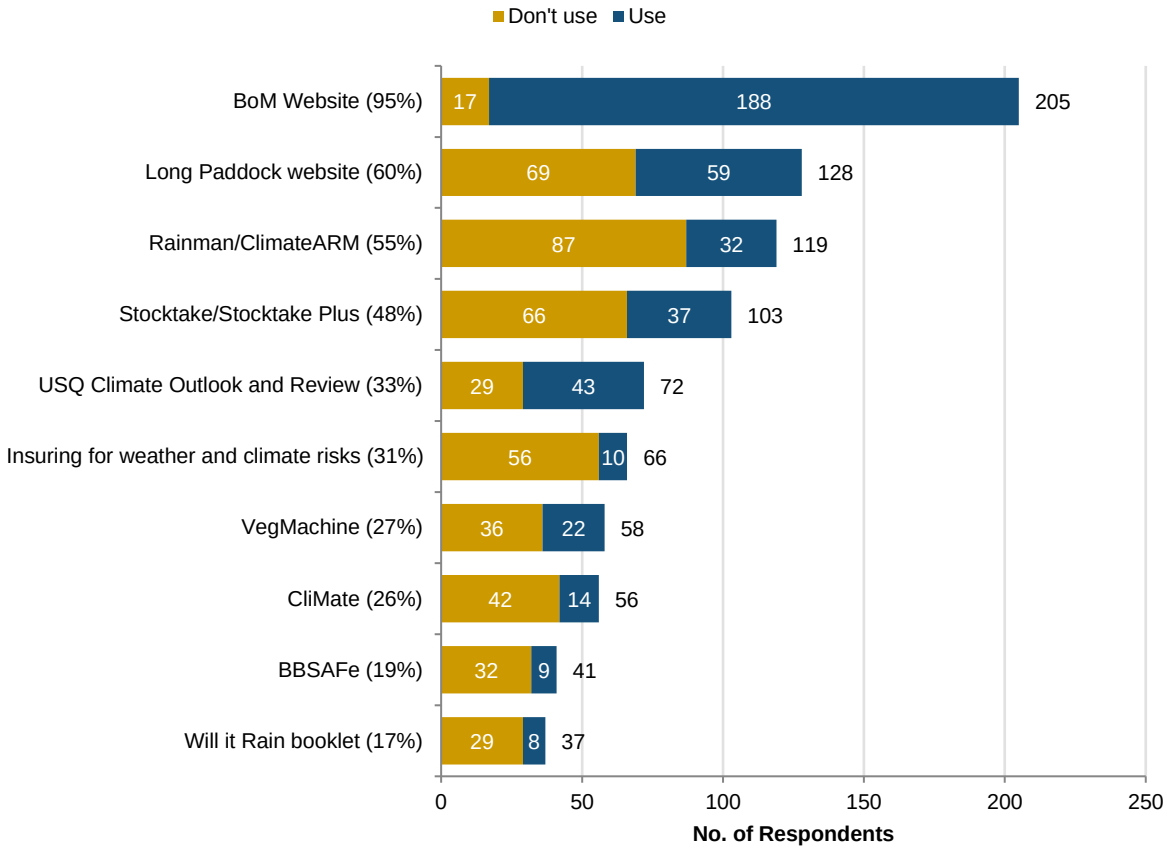
Tools/Resources

- The BoM Website was by far the most well-known and used resource when planning (or assisting clients plan) for climate variability, with a 95% overall awareness and 87% usage rate.
    - Of the 188 respondents who used the BoM website: 68% used *ENSO tracker*, 55% *MJO or 40 day wave*, and 30% *POAMA*.

- Of the 59 respondents who used the LongPaddock Website: 64% used *SOI Phase system rainfall probabilities*, 41% *Forage*, 41% *Rainfall poster,* 25% *SILO*, 22% *AussieGRASS*, and 14% both *SPOTA-1* and *DSITI Climate Risk Matrix Assessment.*

- Tools/resources that Service Providers/Others were more likely to use compared to Producers included: *LongPaddock Website* (41% vs. 21%), *VegMachine* (24% vs. 14%), and *Rainman/ClimateARM* (26% vs. 10%).
- The two most well-known other seasonal climate forecasts were *SST: Sea Surface Temperature Map* (67%) and *IOD: Indian Ocean Dipole* (51%), with 26% of total respondents using *SST* and 19% using *IOD.* There were no real differences between Producer and Service/Provider awareness and usage of other seasonal climate forecasts.

Overall awareness and use of tools/resources (n=215)



Reduced barriers preventing accessing relevant tools/resources and/or knowledge

Only around a third of respondents believed there were barriers preventing them (or their clients) accessing relevant tools/resources and/or knowledge. The top five barriers indicated by these 68 respondents (44 Producers and 24 Service Provider/Other) were: *Internet access* (63%*); Lack of understanding about how to use resources* (54%); *Lack of understanding of technologies used in the resources* (41%); *Scepticism about usefulness of products* (37%); and *Lack of time* (32%).

Applied the tools to key management practices used when planning for climate variability

The top five key management practices used (or clients used) when planning for climate variability by industry were:

- **Beef/Dairy/Sheep:**
    - Adjusting stocking rates according to forage amount and quality (89%)
    - Carrying capacity (82%)
    - Adjusting stocking rates - buy, sell, agistment, etc. (79%)
    - Fencing (62%)
    - Animal segregation, controlled joining or pregnancy testing (60%)
- **Sugar/Cropping/Horticulture:**
    - Planting time/season (79%)
    - Fertilizing/spraying, weed control (72%)
    - Irrigation (51%)
    - Species selection (48%)
    - Harvesting and product processing/management (46%)
- **Other Industry (only 3 options provided):**
    - Identifying climate change impacts and developing climate change adaptation strategies (61%)
    - Developing a drought management plan (39%)
    - Other (11%)

2. End of Program Objectives

- Increased scientific capacity and tools to monitor, predict, advise and plan for climate variability and impacts of climate change.
- Increased awareness, understanding, skills and capacity of industries and producers to make most effective use of tools and information supporting their management of drought, climate variability and adapt to climate change.
- Increased uptake and application by industry, producers and their advisors of available tools, information, practices and strategies to more effectively manage and be productive and profitable in the context of a variable climate.
- Industries and producers seeing clear benefits as a result of using tools and information and making practice changes.

Indicative benefits to date

To meet these objectives, there are a number of individual projects set across the research, development and extension spectrum. The projects are targeted at a range of industry levels from policy makers through to government agencies, NRM bodies, advisers and consultants. The contribution of each of these projects to the overall program objective is captured in the below table - *Planned Individual Project Contributions*. At this stage of the program, many of the outputs are yet to be completed and communication and extension activities are in their early stages. It has been noted that projects were limited in some cases due to tailoring to meet the initial 12-month funding although some were able to gain momentum by building on earlier work.

Informed persons noted overall potential benefits from integration across the suite of projects. These included industry and other decision-makers improving skills and management of climate impacts which could result in the capacity to better adapt to and manage climate variability associated with seasonal and multi-year drought.

Improved scientific capacity and tools

Specific emerging outputs (improved scientific capacity and tools) highlighted by informed persons and project leaders to date include:

- Better understanding of the cycles of wet and dry seasons (DSITI 3.2)
- Mapping products identifying areas with high productivity and potentially high resilience – providing rationale for investment in relationships in particular areas and to explore contributing factors (USQ 19)

As shown in the table under *Outputs and Tools* later in this document, there are a number of tools still under development or planned to be undertaken through the projects. These include:

In development

- Drought probability tool (DSITI 3.2)
- High-resolution daily climate projection tool (DSITI 4)
- Climate and agricultural risk assessment and reporting tool (USQ 6)

Planned

- Suitable insurance products (USQ 6)
- Web-based drought management tool to access maps and forecasts (USQ 7.1)
- Online platform to access models (USQ 7.2)
- Four decision support tools (USQ 9)

Gains in awareness, understanding and skills

As indicated above, this is early in the life of the projects making up the program. Many are still in the process of researching and developing the tools and information to contribute to the overall program objective. Others are specifically designed for stakeholder engagement and developing awareness, increased understanding, skills and interest in utilising available tools and information. The planned engagement and communication activities are described in detail in the later section on C*ommunication and Extension*. Progress in this area to date is outlined below.

Engagement activities that have been undertaken to date and indications of gains made:

USQ 5 / DSITI 12	• Two Climate Risk Matrix workshop held (Calliope; Ayr) – 23 participants – seen to be very useful in terms of considering climate change adaptation issues and respondents' needs (8.7/10 avg.), with respondents indicating high levels of understanding gains on the topics presented (7.8-8.6/10 avg.). • Communication and promotional material developed and ready for distribution at future workshops in collaboration with project DSITI 12 (e.g. brochures, posters, handouts – for each region). • Some engagement has occurred with agriculture industries (Sugar and grazing), NRM groups, emergency management, and local government.
USQ 13	• Two workshops run (Mitchell, Roma) with help from QMDC/DAF – informal feedback indicated they were very beneficial and seen as valued. More will be included here for the final report.
Communication/Extension Activities undertaken to date in other projects	• Extended wet and dry poster developed and presented at workshop for feedback; planned for publishing on LongPaddock website [DSITI 3.2] • Informal sharing of preliminary reports with sugar and cotton stakeholders [USQ 6] • Web-based drought index example presented at DCAP/QDMC workshop [USQ 7.1] • Update of "Will it Rain" [USQ 9] • Provision of existing products for USQ's Applied Climate Science course [DISITI 12] • Project and objectives and benefits explained to 6 growers (wheat and sugar) [USQ 14] • Providing updates to sugar industry [USQ 15]

A number of other communication and extension activities are being planned. It will be critical to document these and gather feedback from stakeholders about the value and impact of the activities on their understanding, interest and resulting actions.

Planned Individual Project Contributions

(As identified by project leaders in May 2017)

Project	Type of Gain	Details
Social research into barriers to	New understanding & insights	**Improved understanding of the major barriers to preparing for drought:**

adoption **(DSITI 1)**		• First project output - report that will include RD&E recommendations
	New understanding & insights	**Improved understanding of issues and the use of decision support tools:** • Second project output - based on feedback from the survey and will also provide recommendations • Highlighted a lot more further questions for exploration – more surveys and interviews about specific decision support tools and issues anticipated • Due to survey not being a robust sample care will be taken extrapolating information
	Consolidation of information	**Improved access to consolidated information:** • A lot of literature on drought and grazing already available but project findings will consolidate information into one place • Gained firsthand accounts and feedback from people working with graziers • Extension officers will appreciate that everything that needs to be said is now all in one place • Policy users will find some new information
Improving seasonal forecasts **(USQ 2)**	Improved data	**Improved seasonal forecasting with direct value to the farming industry via improvements in circulation models**
Modelling multi-year droughts **(USQ 3.1)**	Improved data	**Improved seasonal forecasting data with direct value to the farming industry**
Quantifying multi-year droughts **(DSITI 3.2)**	New understanding & insights	**Improved understanding of what causes multi-year drought and the potential reasons they might break:** • Objective is to add anything to clarify and make it more specific to industry • Producers who use these outlooks will have access to better risk management tools. • Useful for DAF with development of drought preparedness and policies – to improve drought preparedness • Better understanding when heading into drought will mean DAF can also counsel producers to make better decisions
CC projections for ARM **(DSITI 4)**	Consistent data	**Consistency in climate change data projections:** • Information will be application ready – quick to use • Not relying on own modelling and projections • Everyone using same models will ensure consistent comparisons across industries
	Improved decision making	**Better access to improved datasets where users 'don't have to be scientists' to benefit from new information.**
Regional CC adaptation for agriculture **(USQ 5)**	Increased awareness & understanding	**Improved understanding among NRM, emergency management providers and local government of the impacts and adaptation strategies required at regional levels.**
Enhanced multi-peril crop insurance **(USQ 6)**	Improved confidence	**Better climate data and climate risk assessments enabling the insurance industry to more confidently develop insurance products** • Insurances industry currently struggles to develop insurance products – project is filling the data gap by providing better climate data and climate risk assessments. • Knowledge of risks and what farmers want will assist in developing cheaper and more effective products

		• Hoping for a faster uptake of insurance
Developing drought monitoring indices **(USQ 7.1)**	Improved decision making	**More informed decisions by farmers and graziers through the provision of a drought management tool:** • Access to drought indices maps • Access to 3-6 month forecasts
Developing crop forecast models **(USQ 7.2)**	New understanding & insights	**New and interesting understanding gained from using two crops models ASPIN & DSSAT (compared to only one):** • Combining two models gets something different as opposed to relying on APSIN alone • With more studies in Queensland and Australia and most only using APSIM model – adding new models means interesting outcomes can be achieved • Different models can potentially cover different uncertainties and link to crop simulations and a different understanding
Pasture alerts **(DSITI 8)**	Improved decision making	**Easier access to timely alerts to aid in improved decision-making for next season:** • Provide more info than FORAGE – not extended as much as could • Needs user practical advice to come from it. • Assist extension officers providing advice by making it easier with graphs and pastures.

Developing and customising DS tools **(USQ 9)**	Improved decision making	**Online access for producers and advisors to new climate information and technologies:**
		• 'Will it Rain?' is in its fourth edition (since 2009):
		  ○ Delivering new climate information and technologies developed in the last 16 years
		  ○ Updates on climate forecasts and technology
		  ○ Trying to fill the black spots, especially in remote and rural areas.
		  ○ Citizens science project, which involved people sending in rainfall data, which is put into a database
		• ClimateARM online and the information being presented is new for the online component:
		  ○ Initially had Rain Man software, which didn't have daily forecast info - very important to Northern Australia in terms of forecasting the start and end of monsoon periods.

LongPaddock **(DSITI 10)**	Improved communication	**Improved communication and more interactive delivery of information:** • Benefits to the grazing and other agricultural industries • Delivering into other states – the only place to get daily updates from Aussie grass and pasture and climate outlooks for other states
Communicating CC impacts to agriculture **(DSITI 12)**	Broader awareness	**Improved communication of climate change risks to impacted regional communities and businesses (beyond the grazing industry):** • Done at regional scale and impact on different regions – e.g. police, fire, emergency, indigenous, graziers, local councils, environmental • Format is applicable to any industry or business
Revamping MFC workshops **(USQ 13)**	Increased awareness & understanding	**Better understanding of current weather and climate systems, historical data and what can be done to better understand climate:** • Benefits to those attending the workshops • Increased capacity to do their own seasonal climate forecasting – workshops supply knowledge and tools and understanding to their own forecasting

		• Improved understanding to better manage properties
Crop production modelling under CC **(USQ 14)**	New understanding & insights	**New understanding of the biophysical and economic data relating to Qld industry:** • Data relevant to all three crop areas should provide additional insights (compared to only one)
Economic value of SCF in agriculture **(USQ 15)**	New understanding & insights	**Development of high impact journals will build capacity of post doctorates and enhance collaboration with different industries**
	Improved decision making	**Working model that will demonstrate to the sugar industry the economic benefits of using seasonal forecasting (SF):** • From sugar studies the project has found compared with growers not using SF vs those using, they can achieve savings of approximately $18/hectare • Plan to use simple examples to demonstrate the use and value of seasonal forecasting – building confidence in growers and users and the value in using seasonal forecasting data • Phase two of the project we hope to show total value of seasonal forecasting – need to show upscaling value for certain regions to demonstrate the value
Palaeoclimate data for water security **(DSITI 16)**	New understanding & insights	**New transformational and innovate climate data source for Qld:** • Benefits to water security planers and Ag industry – planning for extreme events and disaster management • Incorporate into SILO data set – very innovative and would aid work in future to interpret present and future risk of CC and climate variability. • Desire to continue as 4 year research project to build on and make even more useful - extend to more Qld catchments, greater access to Palaeoclimate indicators, and other environmental indices such as sediment deposits and plant records

EVI MODIS Predicting pasture production drought risk **(USQ 19)**	Improved data	**Higher resolution/finer scale maps of pastures more vulnerable to drought (and which might recover better):**
		• A lot of mapping to date has been at courser scale (5kms), ours our smaller 250 meters squared.
		• Finer scale mapping is picking up detail and variability on how pastures respond.
		• Mapping is indicating variability within 5 km and then breaking it down to a finer and more detailed picture to how pastures are responding
		• Regional bodies interested in information:
		  ○ Value of whole landscape maps to determine areas requiring attention
		  ○ Allows better prioritisation of resources
		  ○ Seen as a good discussion catalyst with landholders – e.g. handling dry periods better and initiating discussion about management practices

	Improved decision making	**Access to mapping data that will assist farmers make more strategic drought planning decisions:** • Farmer might be able to pick up between paddocks which are most vulnerable and when drought is forecast they could for example move stock off a paddock quicker • Ability to pick out those pastures able to recover best and make use of wet periods

3. Communication & Extension

Appropriateness, quality, reach, engagement, access and reactions from participants engaged in extension and communication activities across projects.

Indicative benefits to date

As noted previously, DCAP has some projects which focus on engaging with stakeholders, training and awareness raising while others have specific planned engagement activities within their development and research activities. This section provides more details on the projects with specific planned engagement activities and outlines progress made to date.

As expected, these activities have only recently commenced and much work will be needed over the life of the projects to maximise the awareness, understanding, interest and adoption of this new knowledge, tools and practices. However, where rigorous feedback data has been captured on activities, stakeholders have shown significant gains in understanding and interest and value the information presented. Project specific details are shown below.

USQ 5 Regional CC adaptation for agriculture

Undertake series of workshops using the Climate Risk Matrix approach targeted at primary producers to communicate the risks of climate change and develop adaptation pathways.
(In collaboration with project DSITI 12 Communicating climate change impacts to agriculture)

Planned project contribution	Improved understanding among NRM, emergency management providers and local government of the impacts and adaptation strategies required at regional levels.

PROJECT PROGRESS

Overall Progress	• Two Climate Risk Matrix workshops held (Calliope 23/3/17, Ayr 25/5/17) with four more planned. • Communication and promotional material developed and ready for distribution at future workshops in collaboration with project DSITI 12 (e.g. brochures, posters, handouts). • Some engagement has occurred with agriculture industries, NRM groups, emergency management, and local government.	**On-track** (with minor delays)
Evaluation / Impact	**Positive progress was made against the planned project contribution with workshop participants indicating high increases in understanding on relevant topics as a result of the workshop.** • 23 post-workshop feedback sheet responses collected to date (14 for Calliope and 9 for Ayr). • Workshops were seen to be very useful in terms of considering climate change adaptation issues and respondents' needs (8.7 avg.), with respondents indicating high levels of understanding gains on the topics presented (7.8-8.6 avg.). • Respondents described the workshops as being *very relevant, very information, well organised,* and *well presented;* and intended to share and promote what they had learnt with others.	**Positive Progress**

Issues / Barriers	Slight delays in delivery of workshops – future workshops are well planned and awaiting negotiations to confirm dates and locations.	**Minor delays**

DSITI 12 Communicating CC impacts to agriculture

Joint project with USQ to deliver the Climate Change Risk Matrix Workshops (USQ 5).

Planned project contribution	Improved communication of climate change risks to impacted regional communities and businesses (beyond the grazing industry).

PROJECT PROGRESS

Overall Progress	• Assisted with communication products for CC Risk Matrix workshops (USQ 5), including brochures and communication products for each of the 13 regions. • Assisted project USQ 9 with upgrades and collaborated with with projects DSITI 16 and DSITI 3.2 through information sharing.	**On-track**
Evaluation / Impact	• See project USQ 5 • **Informed persons** noted that evaluations from the workshops delivered to date were very positive.	**Positive Feedback**
Issues / Barriers	See project USQ 5	**Minor delays**

USQ 13 Revamping MFC workshops

Develop content for the MFC series ensuring climate information presented is tailored to the needs and timing of key decisions and engage with key stakeholders to run ten workshops.

Planned project contribution	Better understanding of current weather and climate systems, historical data and what can be done to better understand climate.

PROJECT PROGRESS

Overall Progress	• Two well attended workshops delivered in Mitchell and Roma with help from QMDC – three more workshops planned for mid-May in the Border Rivers region. • Engaged with DAF and Qld Murray Basin Commission to help prepare and organise workshops. • Planning of five workshops by DAF (Pomona, Tansey, Mundubbera and Kingaroy booked) and expected to be delivered in June.	**On-track** (with minor delays)
Evaluation / Impact	**Workshop feedback:** Feedback and evaluation of participant responses indicated: • Unanimous support and need for more and better publicised workshops to cover the void left by more than decade of not conducting these activities. • They are highly valued – particularly from people who haven't been previously exposed. • Those who have previously attended, valued refreshing their knowledge even if they were already aware of the information presented.	**Positive Feedback**
Issues / Barriers	Delays in delivering workshops due to the USQ project leader resigning, wet weather and unforeseen delays in scheduling:	**Minor Delays**

	• To address scheduling delays, it was agreed that staff from NRM groups (QMDC) and DAF would help organise and facilitate workshops.	

Communication and extension activities from development and research projects

Project	Activity Type	Details	Source
Social research into barriers to adoption **(DSITI 1)**	Communication of findings	[Planned] In addition to reports produced, findings will be delivered via seminars and workshops	1
Modelling multi-year droughts **(USQ 3.1)**	Communication of findings	[Planned] Results these will be discussed at high level scientific meetings: • Cautious in releasing info before testing • Results will be gently introduced to the farming population once they are thoroughly tested.	1

Improve the ability of forecasts to predict multi year drought **(DSITI 3.2)**	Communication & promotional material	Queensland extended wet and dry period poster developed (prior to project):
		• Poster created to qualitatively account for the extent of drought historically through QLD
		• Conversation starter as stakeholders want to know understand the analysis underneath
		• Ready to be published on the LongPaddock website to coincide with the official launch of the Queensland Drought Mitigation Centre
		• Feedback on poster:
		  ○ Only showing at the workshops to gain feedback - all want to know the science behind it
		  ○ Positively reviewed by Professor Mark Howden, Director of the Climate Change Institute at the Australian National University
			1 & 2

CC projections for ARM **(DSITI 4)**	Communication & promotional material	[Planned] Promotion of the new website through climate risk workshops (USQ 5)	1
Enhanced multi-peril crop insurance **(USQ 6)**	Stakeholder Forum	[Planned] High level event in Brisbane (5th July 2017): • Operationalise findings through high-level workshops • Attended by 200 participants • Include presentations and key note speakers from the head of the insurance • Hoping to invite representative from the Dept of Resource and Dept of Ag and Environment, high level government, insurance agencies and agriculture industries	1
	Communication of findings	Informing stakeholders (sugar and cotton industries): • Interaction regarding project outcomes • Shared preliminary reports • Kept informed of products and tools that will be available	1
Developing drought monitoring indices **(USQ 7.1)**	Communication of findings	Web based drought index examples presented at DCAP/QDMC project workshops in Brisbane (27-28 March 2017)	3

Developing crop forecast models **(USQ 7.2)**	Conference/meeting	[Planned] Conference/meeting with growers and industry stakeholders (including QFF) in June 2017 to promote the project's work.	1
Developing and customising DS tools **(USQ 9)**	Communication & promotional material*	Update of "Will It Rain": • DSITI 12 project assisted several images replacing/upgrading supplied for three chapters along with text edits.	2
LongPaddock 2020/FORAGE/Agile PM **(DSITI 10)**	Promotion	[Planned] Promotion as part of delivering science tools	1
Communicating climate change impacts to agriculture **(DISITI 12)**	Communication & promotional material	Provided existing products suitable for USQ's Applied Climate Science course.	2
Crop production modelling under CC **(USQ 14)**	One-on-one	Project objectives and benefits explained through interviews with 6 growers (3 wheat and 3 sugarcane)	1
	Workshops	[Planned] Future workshops planned to share project findings and demonstrate how strategies will impact production	1
Economic value of SCF in agriculture **(USQ 15)**	Communication of findings / workshops	• Working with sugar industry providing updates on progress for all projects • Starting to present findings in project workshops and trying to bring credibility to the methodologies used	1
	Workshops	Planned] Extend findings via workshops (through the extension and communication component of DCAP) • Findings would be part of these workshops • Aim of these climate workshops is to build capacity – educate and show how to use the climate tools and models and promote the benefits.	1

*With assistance from project DSITI 12 (Communicating climate change impacts to agriculture)
Sources: 1. Project Leaders Survey (April 2017); 2. DSITI Quarterly Progress Report (Dec 16-Mar 17); 3. USQ Quarterly Progress Report (Dec 16-Mar 17)

4. Products & Tools

Number, type, purpose, appropriateness, accuracy, rigour, quality, user-friendliness and accessibility of products and tools developed.

Indicative benefits to date

Key to this program is the development of scientifically sound, user-friendly and useful tools for managing drought and climate adaptability. The projects dedicated to the development of these tools are shown below, together with the details of progress and planned intent. Given the stage of the program, the tools are still in the development or planning phase. There is no completed tool ready for widespread trial and use.

Critical to the evaluation will be the review of the tools in terms of their underpinning science as well as testing and feedback from potential users to ensure their applicability to the situation and target group. A further critical factor will be how the tools are effectively integrated in extension programs to ensure that they are known, understood and users (producers and advisers) have the skills to apply them effectively to a specific enterprise context.

Project	Tool Type	Details	Source
Improve the ability of forecasts to predict multi year drought (DSITI 3.2)	Planning Tool	**[In Development] Drought probability tool:** • Map based tool using diff risk ratings depending on conditions at the time • More research needed to tighten up analysis. • Not intended to be publicly available • Prototype tool for calculating the probability of drought will be developed before the end of June 2017 • Once developed further possibility of developing a specific workshop to extend the tool - perhaps within Long Paddock extension tools • Talk to shareholders at end of this program and extend the prototype.	1 & 2
CC projections for ARM (DSITI 4)	Planning Tool	**[In Development] High-resolution daily climate projection tool:** • Developing backend processing to enable high resolution daily climate projection data delivered in an application-ready format to be used by common biophysical models (e.g. hydrology, crop and pasture models) for simulation modelling • Better access to improved datasets where users 'don't have to be scientists' to access new information	1 & 2
Enhanced multi-peril crop insurance (USQ 6)	Planning Tool	**[In Development] Climate and agricultural risk assessment and reporting tool:** • Prototype completed • Will allow quantification of key climate risks, initially for sugar and cotton industry	3

	Insurance products	**[Planned] Suitable insurance products:**
		• Next phase of the project is to have suitable insurance products available and to determine how to operationalise these:
		  ○ who will sell it and how – insurance industry/ sugar industry.
		  ○ Couple of pathways to explore how to bring to market the products in a manner that is relevant to farmers.
		  ○ Surveys found a strong response that if products were available and affordable, farmers would think more about insurance
			1

Developing drought monitoring indices (USQ 7.1)	Mgmt. Tool	**[Planned] Web-based drought management tool to access maps and forecasts:** • Support farmers and graziers to make more informed decisions • Maps of the drought indices will be available to anyone vie a web based tool • Forecasting for 3-6 months • Initially hosted on USQ website with plans for Qld Gov. to take control	1
Developing crop forecast models (USQ 7.2)	Modelling Tool	**[Planned] Online platform to access models:** • Targeted at producers across the three crop areas (wheat, sorghum, sugarcane)	1

		• Additional platform required for platform to work with the both crop models (DSSAT) • Overall project objective is to set up a website	
Developing and customising DS tools (USQ 9)	Planning Tool	**[Planned] Four decision support tools:** • 'Will it Rain?' Edition 4 • BBSAFe • ClimateARM • 'Who got the Rain?' (Facebook)	1

Sources: 1. Project Leaders Survey (April 2017); 2. DSITI Quarterly Progress Report (Dec 16-Mar 17); 3. USQ Quarterly Progress Report (Dec 16-Mar 17)

5. Development Activities

Extent of development as per plans – completion of trials, pilots, tests and demonstration and results. Extent of involvement of end-users in development.

Progress to date

As noted in the *Products and Tools* section a number of projects are dedicated to develop tools and outputs for use in decision-making and planning. From an evaluation perspective, the interest is in the progress and rigour of these development activities and also in the extent to which end users are involved in the process to ensure the relevance and usefulness of the resulting tools. There is no stakeholder feedback reported to date, however this will be sought from relevant projects as the tools are developed.

The data shows that most of these projects are on track – some with minor delays and one with scope issues. Minor delays included problems around: times for trials and lack of external cooperation (USQ 7.2); delays in receiving programming support (DSITI 8); and staffing and platform issues (USQ 9). One project (DSITI 10) had the scope of the project reduced due to the unanticipated scale and technical complexity (e.g. unfamiliar AWS environment) of the LongPaddock website. Synching issues with other related projects was also a minor problem (USQ 19).

One project (DSITI 4) has a significant delay due to flow-on effects of a reduction in the scope of the LongPaddock project (DSITI 10) and errors found in the bias corrected high resolution climate change projections. Project specific details are shown below.

DSITI 4	**CC projections for ARM**

Provide easy access to a consistent set of the best available high resolution synthetic climate projections data across Queensland for use in biophysical models.

Planned project contribution	• Consistency in climate change data projections. • Better access to improved datasets where users 'don't have to be scientists' to benefit from new information.
Planned tools	High-resolution daily climate projection tool.

PROJECT PROGRESS

Overall Progress	Development of the backend processing to enable the high resolution daily climate project data has commenced but has been hindered by the issues/barriers detailed below.	**Some Progress**
Evaluation / Impact	• No evaluation/impact data available • **Informed persons** noted that this had the potential to be included in bio-physical modelling meeting an important need. It was noted that while a number of groups are doing modelling, this project had a focus on climate change scenarios – filling the gap.	**N/A**
Issues / Barriers	• Reductions in scope of the LongPaddock project (DSITI 10) has impacted on the redevelopment of the Consistent Climate Change website and is unlikely to be completed as planned – interim solution of modifying the current web interface to provide users with data drill requesting is being investigated. • Delays in achieving Milestone 3 due to errors found in the bias corrected high resolution climate change projections – need to be corrected before the backend processing can continue.	**Significant Delays**

USQ 7.1 Developing drought monitoring indices

Identify drought indices for Queensland drought environment and conditions.

Planned project contribution	More informed decisions by farmers and graziers through the provision of a drought management tool.
Planned tools	Web-based drought management tool to access maps and forecasts.

PROJECT PROGRESS

Overall Progress	• Literature review completed and the development of web-based drought indices in development with examples presented at the DCAP/QDMC project workshops in March 2017. • Collaboration with other projects has occurred through monthly meetings with USQ projects where findings are presented and discussed. • Possible collaboration with the University of Nebraska – developing similar monitoring tools – has been explored with initial contact made and a meeting held.	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	No issues/barriers have been reported	**None reported**

USQ 7.2 Developing crop forecast models

Develop and calibrate two crop forecast models (ASPIN and DSSAT) for three Queensland crops (wheat, sugar cane and sorghum).

Planned project contribution	New and interesting understanding gained from using two crops models (ASPIN & DSSAT) compared to only one.
Planned tools	Web-based platform to access both crop models.

PROJECT PROGRESS

Overall Progress	• Calibration, testing, and analysis of both models on-track. • Industry engagement included interviews relating to crop management practices in selected areas to determine validity of model parameters in line with the main practices in the region. • Collaboration with other projects included providing configs and forecasts for USQ 7.1 and USQ 15. • Planned conference/meeting with growers and industry stakeholders (including QFF) in June 2017 to promote the project's work.	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	Lack of time to produce trials has resulted in reliance on external people with existing works willing to share data – can prove difficult finding the correct crop parameters (particularly for sugarcane).	**Minor Issues**

DSITI 8 Pasture alerts

Provide email alerts to subscribers with tailored property-specific practical advice and seasonally relevant information to aid recipient's decision-making in relation to pasture forecasting for the next season (e.g. matching stocking rates).

Planned project contribution	Easier access to timely alerts to aid in improved decision-making for next season.

PROJECT PROGRESS

Overall Progress	• Currently on the LongPaddock (DSITI 10) website as a placeholder – aim to be available at the end of June. • Draft pasture alert report developed with feedback received from key DAF extension staff – improvements were made based on this feedback. • Continuing to seek feedback from potential users (extension officers and consultants) and explore the potential to refine and customise the alert levels of the report to improve useability. • Rigorous and more formalised consultation process with users and extension officers is planned including workshops to extend information and increase understanding of the alerts.	**On-track (with minor delays)**
Evaluation / Impact	• No evaluation/impact data available • **Informed persons** highlighted the value of pasture modelling tool – with some differences in opinion about whether it would have direct use by producers or of more use for the adviser and research community.	**N/A**
Issues / Barriers	Waiting on the availability of key programming and technical staff (occupied with other DCAP projects) to implement statistics and backend processing to confirm the validity of the calculations.	**Minor Delays**

USQ 9 Developing and customising DS tools

Development and customisation of four decision support tools: 'Will it Rain?', BBSAFe, ClimateARM, 'Who got the Rain?' (Facebook).

Planned project contribution	Online access for producers and advisors to new climate information and technologies.
Planned tools	'Will it Rain?'; BBSAFe; ClimateARM; 'Who got the Rain?' (Facebook)

PROJECT PROGRESS

Overall Progress	• Progress of the four decision support tools:
	  ○ 'Will it Rain?': Competed and with publishers – expected to go to print by the end of the project.
	  ○ BBSAFe: Programming in progress and on-track to be completed.
	  ○ ClimateARM: Prototype currently in testing
	  ○ 'Who got the Rain?' (Facebook): Programming in progress and on-track to be completed – prototype of an external webpage developed.
	• Industry engagement has occurred through consultation and collaboration with DAF and other experts.
		On-track (with minor delays)

Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	• BBSAFe prototype version delayed by HR issues - new staffing arrangement will deliver the end product by 30 June. • 'Who got the Rain?' issues with Facebook API and automated feed – currently being investigated	**Minor Delays**

DSITI 10 LongPaddock 2020/FORAGE/Agile PM

Provide information to graziers and extension officers in agriculture and grazing on the impacts of climate – including outlooks and seasonal information to assist seasonal decision making.

Planned project contribution	Improved communication of and more interactive delivery of climate information.

PROJECT PROGRESS

Overall Progress	• Initiation phase complete and delivery phase in progress – first delivery phase targeting a redesign of FORAGE to allow more interactive map-based property searches. • Engagement of users through a web survey is informing the design and redevelopment process. • Positive feedback and practical ideas for improvement received from project board and DSITI staff when progress was presented in March 2017 • The project will collaborate with other DCAP projects and provide a platform to extend project outputs (e.g. new information, tools, products).	**On-track (with revised scope of Phase 1)**
Evaluation / Impact	• No evaluation/impact data available • **Informed persons** were very positive about this project – one described it as 'the best climate site in Australia and possibly the world'. Another noted that this newer version had great potential – and that it had been demonstrated to stakeholders.	**N/A**

Issues / Barriers	Scope of the project reduced due to the unanticipated scale and technical complexity (e.g. unfamiliar AWS environment) of the LongPaddock website – agreed by the project board	**Scope Issues**

USQ 14 Crop production modelling under CC

Use of historical and projected climate data to model crop production 30-40 years ahead – based on the biophysical modelling framework from project USQ 7.2.

Planned project contribution	New understanding of the biophysical and economic data relating to Queensland industry.

PROJECT PROGRESS

Overall Progress	• Calibrations and testing of models undertaken, including looking at different adaption strategies for the target crops both in Queensland and overseas (a lot of work undertaken for Cotton adaption strategies) • Industry engagement undertaken through grower interviews (approx. 6) relating to the use of decision support tools and modification of farm investment and crop/irrigation management strategies – also involved informing growers of the project's objective and potential benefits. • Future workshops planned to share project findings and demonstrate how strategies will impact production. • Collaboration with project DSITI 4 through data sharing and meetings.	**On-track**
Evaluation / Impact	• No evaluation/impact data available • An **informed person** noted interest in what has come out of the engagement to date and looking at the different approaches being taken.	**N/A**
Issues / Barriers	Slight difficulty calculating CO2 effects on sugarcane without equations	**Minor issue**

USQ 19 EVI MODIS Predicting pasture production drought risk

Focused on mapping pasture vulnerability in the Darling Downs using remote sensing technology.

Planned project contribution	• Higher resolution/finer scale maps of pastures more vulnerable to drought. • Access to mapping data that will assist farmers make more strategic drought planning decisions.

PROJECT PROGRESS

Overall Progress	• Mapping of pasture trends over different time periods (representing short and long term drought conditions) has been completed for the Darling downs grazing land management zone. • Currently engaging with larger regional bodies and landholders to determine how the data/maps can be improved • Some collaboration has occurred with project USQ 7.1 looking at mapping indices and vulnerabilities – potential overlap and value adding with this project. • Regional bodies have shown interest in the project outputs, with value seen in whole landscape maps to determine areas requiring attention and	**On-track (with minor delay)**

	subsequent better prioritisation of resources. This data is seen as a good discussion catalyst with landholders.	
Evaluation / Impact	• No evaluation/impact data available • An **informed person** saw this is potentially very useful to landholders providing more focus and confidence in landscape monitoring and management.	**N/A**
Issues / Barriers	Delayed start to project has resulted in being 'a bit out of sync' with other projects	**Minor delay**

6. Research Activities

Some projects focus very much on the underlying research needed to properly understand the science or the context in which producers operate. This information will inform the whole program as it moves forward and selects future projects as well as providing input to current or subsequent development projects.

As with the development projects, the evaluation interest is in the progress of the trials against plans, the level of scientific rigour employed and issues arising that may impact on the timing or quality of the resulting outputs. Involvement of end-users in the process is another positive indicator. Examples include:

- DSITI 3.2 - quantifying multi-year droughts reported testing the developed poster with workshop participants and also having the work positively reviewed by Professor Mark Howden, Director of the Climate Change Institute at the Australian National University.
- DSITI 1 – by definition this project is engaging with stakeholders through surveys and interviews as they research barriers to adoption.
- USQ 6 - Industry engagement with respect to multi-peril insurance is integral to the project including: involvement of insurance industries and Qld Farmers Federation; meetings with industry and insurance experts; and grower interviews

The data available to date, shows that all projects are on track with only minor delays/issues to some. The social research into barriers to adoption (DSITI 1) was delayed through the time taken to obtain contact details and changes to the research objective; software engineering challenges associated with the data transfer system in the modelling project were described as having been a good learning experience (USQ 3.1); quantifying multi-year droughts (DSITI 3.2) was challenged by difficulties with staffing and trying to recruit a climate scientist; (USQ 6) enhancing multi-peril crop insurance was a bigger task than anticipated and a lower more realistic number was determined; and Paleo-climate data for water security (DSITI16) reported delays with tripartite collaborative research agreement – but is now back on track. Project specific details are shown below.

DSITI 1	**Social research into barriers to adoption**

Understand the barriers to drought preparedness (DAF) and collect information about decision support tools to help prepare for drought (DSITI) through semi structured interviews and surveys.

Planned project contribution	• Improved understanding of the major barriers to preparing for drought. • Improved understanding of issues and the use of decision support tools. • Improved access to consolidated information.

PROJECT PROGRESS

Overall Progress	• All surveys and interviews have been conducted with analysis in progress and main themes already emerging – the project is on track to be completed by June 2017. • Collaborated with the decision support tool projects to address major objectives and ensure relevance of questions. • Currently writing proposal for Phase 2 and talking with a range of potential future stakeholder including USQ and DISIT.	**On-track**
Evaluation / Impact	• No evaluation/impact data available • An **informed person** noted the importance of the social aspects around health and suicide risk associated with climate challenges and the value this would have in helping people have the capacity to manage such challenges.	**N/A**
Issues / Barriers	Process took longer than expected due to the considerations of different research objective and the time to gain contact details of those to interview and survey.	**Minor issue**

USQ 2 Improving seasonal forecasts

Identification of existing and/or potential mechanisms and data sources and develop a framework to integrate indices into risk management processes.

Planned project contribution	Improved seasonal forecasting with direct value to the farming industry via improvements in circulation models.

PROJECT PROGRESS

Overall Progress	• All databases compiled and detailed analysis undertaken which has led to the identification of seven observation 'phases' – currently being assessed and related to rainfall and temperature data in eastern Australia and Queensland. • No industry engagement yet as it is too early to release this type of critical information – results will be thoroughly tested over the coming years and slowly introduced to the farming population • Continued liaison with BoM relating to how breakthroughs obtained may be incorporated into advances made using ACCESS-S.	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	No issues/barriers have been reported	**None reported**

USQ 3.1 Modelling multi-year droughts

Short Description

Planned project contribution	Improved seasonal forecasting data with direct value to the farming industry.

PROJECT PROGRESS

Overall Progress	• All required data downloaded to USQ from UKMO and skill assessments currently being performed for yearly and multi-year periods. • Arrangements secured with both UKMO and BoM – including a joint working group with BoM aimed at extending project into a more refined system over coming years and ensuring this project is successful	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	Unforeseen software engineering challenges associated with the data transfer system have been a good learning experience	**Minor Issues**

DSITI 3.2 Quantifying multi-year droughts

Involves researching 120 years of historical rainfall records to try understand the influence of climate drivers on wet and dry Queensland periods.

Planned project contribution	Improved understanding of what causes multi-year drought and the potential reasons they might break.
Planned tools	Map-based drought probability tool using different risk ratings (not intended to be publicly available)

PROJECT PROGRESS

Overall Progress	• Key analysis undertaken and feasibility assessment to meet Milestone 3 has been achieved – project on track to be complete by June 2017. • Queensland Extended Wet and Dry Period Poster developed (prior to project) and shared at the Risk Matrix Workshops (USQ 5): ○ Intended to be a conversation starter ○ Ready to be published on the LongPaddock website (DSITI 10) to coincide with the official launch of the Queensland Drought Mitigation Centre	**On-track**
Evaluation / Impact	Queensland Extended Wet and Dry Period Poster: • Workshop participants who were shown the poster were interested in understanding the science behind it – providing successful as a conversation starter • Positively reviewed by Professor Mark Howden, Director of the Climate Change Institute at the Australian National University • **Informed person** noted the importance of this project in terms of quantifying drought in Australia and the cycles over 120 years which will help manage adaptation going forward. The poster was seen as a good visual to have on the website.	**Positive Feedback**
Issues / Barriers	Difficulties with staffing and trying to recruit a climate scientist through USQ – position likely won't be filled until the end of the project	**Minor Issues**

USQ 6 Enhanced multi-peril crop insurance

Develop prototype of locally/industry suitable MPCI insurance products.

Planned project contribution	Better climate data and climate risk assessments enabling the insurance industry to more confidently develop insurance products.
Planned tools	Climate and agricultural risk assessment and reporting tool.

PROJECT PROGRESS

Overall Progress	• All activities are in line with objectives and on-track – including completion of the literature review; data collection (55 structured surveys), modelling for sugarcane and cotton; prototype climate assessment tool including collection of preliminary cotton and sugar data; and a detailed report on data collection. • Industry engagement integral to the project including: involvement of insurance industries and Qld Farmers Federation; meetings with industry and insurance experts; and grower interviews. • Stakeholder have been kept informed with interaction regarding project outcomes; sharing of preliminary reports; and keeping them informed of the products and tools that will be available. • Collaboration has occurred through data sharing with Willis Towers Watson and with the crop modelling and climate forecasting projects (USQ 7.1 & 7.2). • High level event planned in July 2017 to operationalise findings.	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**
Issues / Barriers	Magnitude of the task unanticipated – expecting to contact 50 plus growers from each industry but realisation after collecting data for 2 months that this was unachievable.	**Minor Issue**

USQ 15 Economic value of SCF in agriculture

Short Description

Planned project contribution	• Development of high impact journals will build capacity of post doctorates and enhance collaboration with different industries. • Working model that will demonstrate to the sugar industry the economic benefits of using seasonal forecasting.

PROJECT PROGRESS

Overall Progress	• Integrated economic model developed and economic value of SCF demonstrated for Queensland sugarcane farm case studies of both full and supplementary irrigation management practices. • Engaged the industry through the development of two case studies looking at the value of SCF in irrigation decision making in the sugar and grazing industries – sugar case study completed and currently being written for journal publication. • Working with the sugar industry to provide updates on project progress – findings have started being presented at project workshops to ensure credibility in the methodologies used. • Collaboration has occurred with the crop modelling (USQ 7.2) and seasonal forecasting (USQ 2) projects.	**On-track**
Evaluation / Impact	No evaluation/impact data available	**N/A**

Issues / Barriers	No issues/barriers have been reported	**None Reported**

DSITI 16 Palaeoclimate data for water security

Looking at the relationship between ice flow deposits in Antarctica and the correlation with rainfall in Northern QLD – adding another data set to explain the climate in the past and to explain climate in the present and future.

Planned project contribution	New transformational and innovate climate data source for Queensland.

PROJECT PROGRESS

Overall Progress	• Completed reconstruction of a 1000 year rainfall history for Central Lockyer catchment in SEQ based on a range of palaeoclimate data at both station and catchment-scales – number of decisions that need to be made before this assessment can be finalised (to ensure consistent drought definitions and metrics are used). • Hydrologist is currently working on stats to determine water security planning – to work out next ten years based on 120 years of data. • Potential opportunity to include research in climate change projections used by other projects.	**On-track** (with revised milestone dates)
Evaluation / Impact	• No evaluation/impact data available • **Informed persons** noted this was part of larger collaboration looking at historical climate change with implications beyond Queensland with benefits for future water management.	**N/A**
Issues / Barriers	Too much time taken to sign tripartite collaborative research agreement (wasted time back and forth) - eventually made good progress and now back on track.	**Minor Issue**

7. Project Management

Organisational involvement

The program is a collaboration between a number of partners – particularly DAF, DSITI and USQ. In its first year, the pressure has been on to establish projects and produce early results. Indications from feedback are that there is scope for more collaborative opportunities between the major parties to share information, cross-fertilise ideas and look for synergies and integration across research, products and tools. A recent 'speed-dating' approach of sharing information between projects was reported to have been very beneficial. This collaboration is a critical area to further develop to maximise the synergies between the projects and obtain the best outcomes.

Some organisational challenges have been noted around going through the process of putting on needed staff for the projects.

Program level meetings held to date are summarised in the table below.

Overall management and coordination

Activity Summaries

DCAP Project Collaboration Workshop (27 March 2017) – feedback summary:
• 10 respondents completed post-workshop feedback sheets
• Usefulness of the workshop in terms of:
  ○ (6.7 avg.) Sharing information about DCAP projects
  ○ (7.8 avg.) Providing introductions to other DCAP project staff
  ○ (7.0 avg.) opportunities to identify potential collaboration opportunities between DAF/DSITI/USQ in the future
• Overall positive comments relating to the workshop including: *went well; great idea as it allowed meeting with various researchers; effort for first workshop.*
• It was suggested that more time was needed for sharing information about each project and preliminary results.

DCAP Planning workshop (28 March 2017) – overall:
• 10 respondents completed post-workshop feedback sheets
• Usefulness of the workshop in terms of:
  ○ (8 avg.) Background information provided by DCAP core partners on progress in year one (8 avg.)
  ○ (7 avg.) Information provided about cross-RDC investment opportunities
  ○ (7 avg.) Sessions clarifying users of program outputs and their needs
  ○ (6 avg.) Clarifying future investment themes for DCAP Program years 2-5
• Overall positive comments on potential collaboration with DCAP in the future including: *improved collaboration leading to co-development of practice solutions with key industries; great opportunities for organisational cross-collaboration on key projects;* and *will definitely be working closely with DCAP*
Qualitative summary:
• Positive elements:
  ○ Group diversity/range of stakeholders (14 mentions)
  ○ Quality/robust interaction/collaboration/discussion around issues and opportunity for input (13 mentions)
  ○ Praise for workshop process/presenter (10 mentions)
  ○ Networking/new contacts (6 mentions)
  ○ Praise for program process/outcomes (5 mentions)
  ○ Increased understanding/new ideas (5 mentions)
  ○ Positive to see interest/investment in the area (4 mentions)
  ○ General positive (4 mentions)
• Lightbulb moments:
  ○ Need for industry engagement/primary innovation/understanding market segments (5 mentions)
  ○ Need for/importance of extension (5 mentions)
  ○ Importance of cross-industry approach (5 mentions)
  ○ More integrative/system approaches to drive transformational change (5 mentions)
  ○ Increased understanding of the program and it's objectives, goals, investment intent (4 mentions)
  ○ Rules of thumb (3 mentions)
  ○ Technical concepts - Drought predictions/multi-year forecasts (3 mentions)
  ○ Technical concepts - Other (3 mentions)
  ○ Horticulture different to other industries (2 mentions)
  ○ Need for investment (2 mentions)
  ○ Decision support tools (2 mentions)
  ○ Need for long-term government commitment (1 mention)
  ○ Need for better M&E (1 mention)
  ○ Value of women leading change (1 mention)
  ○ Importance of not rushing the process (1 mention)

Advisory and management committees

The DCAP Steering Committee meets quarterly and includes DAF (x2), DSITI, DNRM, USQ, AgForce, and QFF representatives. As noted earlier, members will be interviewed for their perspectives on the program to date and looking forward to Phase 2. Their views will be summarised and included in the final report.

APPENDIX 1: FULL PROJECT SUMMARIES

Communication & Extension Activities

Regional CC adaptation for agriculture (*USQ 5*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially achieved**

Activity Type	Details	Source
Workshops*	• 2 Climate change risk matrix workshops held (Calliope 23/3/17, Ayr 25/5/17) – summary of feedback: ○ 23 post-workshop feedback sheet responses completed – 14 for Calliope and 9 for Ayr (all ratings below on a 0-10 scale). ○ Workshops were seen to be very useful in terms of considering climate change adaptation issues and respondents' needs (8.7 avg.). ○ High level of understanding gains on presented topics (7.8-8.6 avg.), with the highest gains in understanding *in the basis of the Climate Risk Management Matrix and how it is used* (8.2 avg.) and *how the Climate Risk Management Matrix could be adapted to your enterprise/industry/organisation (8.6 avg.).* ○ Following the workshop, respondents indicated they were highly likely to *share what they gained with others* (8.8 avg.), *promote the need for climate change adaption planning* (8.1 avg.), and *continue to work on climate change adaption planning* (7.8 avg.). ○ Positive comments relating to the workshop included: *fantastic, very relevant; good presentation, plenty of interaction and helpful guidance from presenters; very informative; well organised;* and *well presented.* • 4 more workshops planned for May 2017	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Communication & promotional material*	• Seven brochures prepared, graphic designed, discussed with the relevant NRM groups at climate change risk matrix workshops, proof read and have been printed and are ready for distribution at future events - six other brochures are awaiting graphic design. • Communication products (e.g. variable rainfall, wet and dry period and cyclone track posters) provided for use in the workshops • Additional material (slides and figures) describing the longer-term palaeoclimate history of rainfall for Queensland and a summary of the recent climate projection modelling will be provided for the workshops	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	Some engagement with agriculture industries, NRM groups, Emergency management, and local government: • Interest in emergency management – e.g. fire risk in relation to climate change and the environment.	Project Leaders Survey (April 2017)
Collaboration	Collaboration with other projects: • Staff crossovers with delivery	Project Leaders Survey (April 2017)
Issues/barriers	Slightly delayed pending the outcomes of negotiations with NRM groups to confirm the dates and locations of the final 3 Climate Risk Matrix workshops	DSITI Quarterly Progress Report (Dec 16-Mar 17)

Issues/barriers	Delays in delivery (other projects to finish first): • Still 4 to 5 workshops to complete - but these are fairly well planned	Project Leaders Survey (April 2017)

*With assistance from project DSITI 12 (Communicating climate change impacts to agriculture)

Communicating CC impacts to agriculture (*DSITI 12*)

Activity Type	Details	Source
Collaboration	Collaboration with other projects (other than USQ 5): • Information sharing with Palaeoclimate (DSITI 16) and Quantifying multi-year droughts (DSITI 3.2)	
Communication & promotional material	• Progress assisting with communication products for CC Risk Matrix workshop (USQ 5): ○ 6 workshops planned (2 already completed) ○ Helped with brochures and communication products for each region (13 regions) ○ Helped with some additional info for workshops.(including the Palaeoclimate data) • Assisted project USQ 9 with upgrades	Project Leaders Survey (April 2017)

Revamping MFC workshops (*USQ 13)*

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially achieved**

Activity Type	Details	Source
Workshops	• 2 workshops delivered with the help of QMDC (Mitchell, Roma) ○ Well attended ○ Feedback and evaluation shows unanimous support and need for more MCV workshops to cover the void left by more than decade of not conducting these activities (e.g. BMP, FutureProfit, Grain and Graze etc.) ○ Feedback has been that they are very valued – particularly from people who haven't been exposed to them in past ○ Those who have attended in the past are saying they need to be done more widely in other regions and to be better publicised – and although they cover information they were once aware of, they value the refreshers. • 3 more planned for mid-May in the Border Rivers region: ○ Late commencement to duty of DAF staff have resulted in workshop planning delays and cross-movement of other staff has been organised to ensure these workshops are completed. • Planning of 5 workshops by DAF expected to commence soon • DCAP Phase 2 plan to widely promote and have a better extension plan to ensure community awareness and publicity – public engagement will be important	USQ Quarterly Progress Report (Dec 16-Mar 17) Project Leaders Survey (April 2017)
Collaboration	BoM have shown interest in contributing to a weather section in the workshops but have not yet confirmed participation.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	Engagement with DAF and Qld Murray Basin Commission to help prepare and organise workshops	Project Leaders Survey (April 2017)

Issue/Barrier	Delays in delivering workshops due to the USQ project leader resigning, wet weather and unforeseen delays in scheduling: • To address scheduling delays it was agreed that staff from NRM groups (QMDC) and DAF would help organise and facilitate these workshops	USQ Quarterly Progress Report (Dec 16-Mar 17)

Development Activities

CC projections for ARM (*DSITI 4*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially achieved**

Activity Type	Details	Source
Collaboration	Collaborations with other projects: • LongPaddock website interface (DSITI 10)	Project Leaders Survey (April 2017)
Development	• Developing the backend processing to enable the high resolution daily climate projection data: ○ To be delivered in an application-ready format to be used by common biophysical models (e.g. hydrology, crop and pasture models) for simulation modelling • Coding and backend processing for the datadrill has commenced.	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issue/Barrier	• Due to the reduction in scope of the LongPaddock 2020 project the redevelopment of the Consistent Climate Change (CCS) website onto the Amazon Web Services platform is unlikely to be completed as planned. ○ Potential to modify the current CCS web interface to provide users with a data drill requesting facility is currently being investigated and it is increasingly likely that this can be done as an interim solution. • Delay in achieving Milestone 3: Errors found in the bias corrected high resolution climate change projections need to be corrected before the backend processing can continue.	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issue/Barrier	Some delays with delivery of high-res climate projects from EHP	Project Leaders Survey (April 2017)

Developing drought monitoring indices (*USQ 7.1*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Development	• Completed a literature review • Planned next steps: ○ Test suitable drought indices ○ Develop website to deliver maps being produced on a fortnightly basis	Project Leaders Survey (April 2017)

Development	Development of web based drought indices in progress: • Examples presented at DCAP/QDMC project workshops in Brisbane (March 2017)	USQ Quarterly Progress Report (Dec 16-Mar 17)
Collaboration	Collaboration with other projects: • Discussions and presentations of findings with other USQ project managers at monthly meetings Other collaboration: • Contact and meeting with the University of Nebraska who are developing similar things – site called 'Drought Monitor' with a similar layout	Project Leaders Survey (April 2017)

Developing crop forecast models (*USQ 7.2*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Development	Model calibration, testing, and analysis: • APSIN model calibrated for wheat, sorghum and sugarcane • DSSAT model calibrated at various Qld sites (15 sugar and 17 wheat and sorghum sites) • Calibration and testing looked at how the two models compared to yields of the three crops • Analysis determined if accurate and reliable results were gained - model config and some estimations can be justified while some actual conditions cannot be integrated into the model (e.g. pest, disease, and natural disasters can't be simulated) • Both models still running across test sites • Additional cotton project included • Noted that project is also a 'research project' as calibration and testing was required to gain confidence before sharing data	Project Leaders Survey (April 2017)
Development	• Wheat, sorghum and sugarcane yield modelling using DSSAT: ○ Main crop parameters adapted for Australian conditions retrieved from literature ○ Soils parameters adapted from APSoil/APSIM soil types used for APSIM simulations ○ Crop growth simulations at all selected sites for sugarcane and cotton (in progress) ○ Comparisons between observed (official statistics) and predicted yields (using APSIM & DSSAT)	USQ Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	Conducted interviews for wheat and sorghum relating to crop management practices in selected areas to determine validity of model parameters inline with the main practices in the region	Project Leaders Survey (April 2017)
Collaboration	Collaboration with other DCAP projects: • Provided configs/forecasts for DCAP 7 & DCAP 15 • Platform being developed must integrate with crop production simulations.	Project Leaders Survey (April 2017)
Issues/barriers	• Difficulty finding correct crop parameters (primarily sugarcane) – requests sent to people to share data and help with calibrations • Inadequate time (one year) to produce trials – reliant on people with existing works and willing to share data	Project Leaders Survey (April 2017)

Pasture alerts (DSITI 8)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially Achieved**

Activity Type	Details	Source
Collaboration	Collaboration with other projects: • Hosted on the LongPaddock website (DSITI 10) - currently on the site as a placeholder, but will be available at the end of June.	Project Leaders Survey (April 2017)
Industry engagement	[Planned] Report has to go through the rigorous consultation with users and extension officers: • More formalised process and extended through workshops so users understand what we are telling them - learnt from past that we cannot just put information up and expect it to be used	Project Leaders Survey (April 2017)
Feedback / Testing	• Feedback sought from key DAF extension staff on the draft pasture alert report: ○ Improvements made based on feedback included: using only the IRI forecasting system instead of using multiple forecasting systems; simplifying graphs and maps; providing practical advice to users relating to the different pasture alert levels. • Continuing to seek feedback from potential users (extension officers and consultants) and explore the potential to refine and customise the alert levels of the report to improve useability • Development of practical advice to users relating to the different pasture alert levels will be developed in conjunction with DAF extension officers	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/Barriers	• Waiting on the availability of key programming and technical staff (occupied with other DCAP projects) to implement statistics and backend processing to confirm the validity of the calculations	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/Barriers	• Some issues accessing the system – applied for licenses • Difficulty working out right information to include in report – need ability to get feedback from extension officers and producers.	Project Leaders Survey (April 2017)

Developing and customising DS tools (USQ 9)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially Achieved**

Activity Type	Details	Source
Development	Four decision support tools included in the project: • 'Will it Rain?' Edition 4 progress: ○ Content approved by BoM and USQ ○ Completed and with publishers. ○ Expect design and publishing will happen soon and go to print, at least by end of project • BBSAFe progress: ○ Programming in progress – expect to be completed by end of project ○ Backend database design for storing user run scenarios 30% completed ○ API (application program interface) 25% completed ○ Objects forming the basis of scenario analysis calculations 50% complete • ClimateARM progress: ○ First, second and subsequent rainfall events incorporated	USQ Quarterly Progress Report (Dec 16-Mar 17) Project Leaders Survey (April 2017)

	○ On the development server ○ Prototype currently being tested in-house • 'Who got the Rain?' (Facebook) progress: ○ Programming in progress – expect to be finished by end of project ○ Prototype of an external webpage developed for data collection, registration and mapping capability	
Collaboration	Collaboration with other projects: • Tools will be part of the Managing Climate Variability workshops and the extension program of DCAP	Project Leaders Survey (April 2017)
Industry engagement	• 'Will it Rain?' has consulted with DAF and the bureau and other experts in terms of preparing the publications and managing authors of different chapters • ClimateARM has involved collaboration with DAF who has other products in that series (CropARM and a couple of others on the same website). • 'Who got the Rain?' (Facebook) has included collaboration with initiators of the facebook page. • BBSAFe has not involved significant outside collaboration.	Project Leaders Survey (April 2017)
Issues/Barriers	• BBSAFe prototype version delayed by HR issues - new staffing arrangement will deliver the end product by 30 June. • 'Who got the Rain?' issues with Facebook API and automated feed – currently being investigated	USQ Quarterly Progress Report (Dec 16-Mar 17)

LongPaddock 2020/FORAGE/Agile PM (DSITI 10)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially Achieved**

Activity Type	Details	Source
Collaboration	Collaboration with other projects: • Will provide a platform for other projects to extend – e.g. page for the drought mitigation centre when released • New products will be published on the website	Project Leaders Survey (April 2017)
Development	• Website now on a platform that can be controlled and service DAF better • Addressed speed in updating drought maps from minister • First delivery phase will target FORAGE: ○ Redesign to be more interactive to search for properties on a map – visually displaying Australian graphing maps and drought and SLR pages • Under scrutiny through DSITI ICT assurance resulting in extra rigor as an ICT project through our own department	Project Leaders Survey (April 2017)
Development	• Initiation phase complete • Delivery phase in progress - 5 out of 9 development sprints completed • AWS infrastructure designed: ○ Cost modelling for Phase 1 in progress ○ Reviewed by an external and independent AWS architect	DSITI Quarterly Progress Report (Dec 16-Mar 17)
End-user Feedback / Testing	• Web survey results of LongPaddock users have informed the design and redevelopment of the products • Progress to-date presented at a showcase to project board and DSITI staff (13 Mar 2017): ○ Positive feedback provided practical ideas for improvement	DSITI Quarterly Progress Report (Dec 16-Mar 17)

Issues/Barriers	Scope of the project reduced due to complexity of the LongPaddock website (project board agreed)	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/Barriers	• Scope issue: unanticipated scale and amount of work and unfamiliar AWS environment • Merging of old and new –work and rigor to redo things not anticipated • Hours of people working on pasture alerts not accounted for	Project Leaders Survey (April 2017)

Crop production modelling under CC (*USQ 14*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Development	Modelling progress: • Calibrations and testing and looking at different adaption strategies for these crops in QLD and overseas • A lot of work undertaken for Cotton adaption strategies	Project Leaders Survey (April 2017)
Industry engagement	Interviews: • 6 interviews with growers (3 wheat and 3 sugarcane) to explain what the project is doing and the potential benefits • Interviews with grains (wheat and sorghum) growers in the Jondaryan and Pittsworth regions – completed by a colleague in project USQ 15	Project Leaders Survey (April 2017)
Collaboration	Collaboration with other DCAP projects: • Data sharing and meetings with DSITI 4	Project Leaders Survey (April 2017)
Industry engagement	• Interviews relating to the use of DS tools and modification of farm investment and crop/irrigation management strategies conducted with growers (4) and advisers (1) in the Burdekin and Burnett regions • Interview conducted with a Darling Downs extension agronomist aimed at getting a good picture of the adaptation strategies to climate change	USQ Quarterly Progress Report (Dec 16-Mar 17)
Development	Biophysical modelling framework (see DCAP 7.2).	USQ Quarterly Progress Report (Dec 16-Mar 17)
Issues/barriers	Difficulty calculating CO2 effects on sugarcane without equations	Project Leaders Survey (April 2017)

EVI MODIS Predicting pasture production drought risk (*USQ 19*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source

Collaboration	Collaboration with other projects: • Some collaboration with project USQ 7.1 looking at mapping indices and vulnerabilities – potential for future overlap and value adding with this project Other collaboration: • QLD MDC are interested in having maps produced over larger area (southern QLD) and how they could interact with maps to upgrade in future.	Project Leaders Survey (April 2017)
Development	Mapping of pasture trends over different time periods (representing short and long term drought conditions) has been completed for the Darling downs grazing land management zone. ○ Data analysis on pasture trends over different time period completed (February 2017) ○ Mapping of pasture trends across Darling downs grazing lands completed (March 2017) - high resolution maps will be submitted with final report.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	• Currently engaging with larger regional bodies and landholders to determine how the data/maps can be improved • Upcoming meeting with Conservation Farmers to show slides and maps to their landholders to show what they mean and how they can help.	Project Leaders Survey (April 2017)
Issues/barriers	Delayed start to project has resulted in being 'a bit out of sync' with other projects	Project Leaders Survey (April 2017)

Research Activities

Social research into barriers to adoption (*DSITI 1*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Collaboration	Collaboration with other projects: • Worked with decision support tool projects (FORGAE and Aussie Grass) to address major objectives and ensure relevance of questions • Conversations with USQ on possibility of future work – currently writing proposal for Phase 2 and talking with a range of stakeholder including USQ and DISIT	Project Leaders Survey (April 2017)
Research / Industry Engagement	All surveys/interviews conducted: • 50 interviews and surveys – with 40 specialists (government and private) and 10 leading graziers have been completed. • Analysis of specialist interviews has commenced, with main themes emerging.	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/barriers	• Process took longer than expected: ○ Due to different research objectives and clarification of questions ○ Took time to gain details about who to included in the interviews and surveys (several months) • Surveys were not statistically robust based on the number interviewed – but did contribute towards providing an indication of feedback on the tools	Project Leaders Survey (April 2017)

Improving seasonal forecasts (*USQ 2*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Research	Currently involves very detailed mathematical modelling of STR computer simulations. • Still requires testing of results, which is expected to take about 5 years.	Project Leaders Survey (April 2017)
Research	• All appropriate databases compiled for detailed analysis in terms of developing a new composite mathematical seasonal forecasting system. • Required detailed and complex mathematical and statistical analyses have been performed. • Progress towards development of improved prototype forecast system includes: ○ Major effort collating and analysing data which has led to the Identification of seven observation 'phases' associated with the rotated principal components which are being assessed and related to rainfall and temperature data in eastern Australia and Queensland	USQ Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	Deliberately not – too early to release this type of critical information: • Plans are to thoroughly test over the coming months and years, then to very gently introduce information to the farming population.	Project Leaders Survey (April 2017)
Collaboration	Continued liaison with BoM relating to how breakthroughs obtained may be incorporated into advances made using ACCESS-S.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Collaboration	Collaboration with other projects: • Very slight collaboration with the multi-year drought project via the managing for climate and variability workshops	Project Leaders Survey (April 2017)

Modelling multi-year droughts (*USQ 3.1*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Research	Strong software engineering aspects to the project (similar to USQ 2): • Involved massive databases and transferring data from the UK government to USQ - very complex but rewarding task	
Research	All the required data have now been downloaded to USQ and skill assessments are now being performed for yearly and multi-year periods.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Collaboration	• Arrangements secured between USQ and UKMO: ○ Details completed at a major meeting between project leader and UKMO managers and scientists ○ Key aspects relating to database transfer issues resolved ○ Unforeseen software engineering challenges associated with the data transfer system have been a good learning experience • Arrangements secured with BoM: ○ Completed with two major meetings between project leader and BoM • Joint working group established with BoM:	USQ Quarterly Progress Report (Dec 16-Mar 17)

	○ Headed by Prof R Stone (USQ) and Dr O Alves (BoM) ○ Aimed at extending project into a more refined system over coming years and ensuring this small first project is successful. • Collaboration with other projects: ○ USQ 2	

Quantifying multi-year droughts (*DSITI 3.2*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Collaboration	Collaboration with other projects: • Poster shared at risk matrix workshops (USQ 5)	Project Leaders Survey (April 2017)
Research	• Analysis has assessed the strength of modifying influences of warm/cool phases of the interdecadal pacific oscillation (IPO) on the southern oscillation index's (SOI) influence on Queensland rainfall using an updated version of IPO (as used in poster) and the SILO rainfall period from 1890-2016 • Feasibility assessment to meet Milestone 3 has been achieved	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/barriers	Difficulties with staffing and trying to recruit a climate scientist through USQ: • Suitable candidate declined • Working with in house programs to help alleviate this issue • Position likely won't be filled until the end of project.	Project Leaders Survey (April 2017)

Enhanced multi-peril crop insurance (*USQ 6*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Research	All activities are in line with objectives and on track: • Completed the literature review • Primary data collection and assessment from the cotton and sugar industry completed: ○ Structured survey of 55 farmers across Qld ○ Results showed key climate risks include hail, drought/dry years, excessive heat, floods and wet weather, excessive rainfall during harvest, cyclone, pest & disease, etc. • Modelling (APSIM runs) completed for sugarcane and cotton (detailed in project 7.2) • Completed the prototype of the climate assessment tool, and collected preliminary data from cotton and sugar industries • Detailed report on data collection completed	USQ Quarterly Progress Report (Dec 16-Mar 17) Project Leaders Survey (April 2017)
Industry engagement	• Insurance industries and QLD Farmers federation are part of the project: ○ QFF helping collect data as their responsibility as part of the joint project • Several meetings with sugar and cotton industries to gain industry expertise as well as gaining input from key insurance experts	Project Leaders Survey (April 2017)

	• Interviews with growers has provided farm level data and provided some direction on what they want, what can they afford, and their preferences – which will assist insurance agencies in developing suitable and affordable products.	
Collaboration	Data from the climate and agricultural risk assessment and reporting tool shared with Willis Towers Watson (WTW) to develop innovative enhanced insurance products	USQ Quarterly Progress Report (Dec 16-Mar 17)
Collaboration	Collaboration with other projects: • Collaborations with crop modelling and climate forecasting projects (USQ 7.1 & 7.2)	Project Leaders Survey (April 2017)
Project management	• Regular project team meetings discussing the progress of the project. • Meetings and other communication has enabled the project partners to work well together.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Issues/barriers	Unanticipated the size of the task: • Expecting to contact 50 plus growers from each industry – after collecting data for 2.5 months realised this could not be achieved	Project Leaders Survey (April 2017)

Economic value of SCF in agriculture (*USQ 15*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Achieved**

Activity Type	Details	Source
Research	• Project started with gaining and understanding of what's been done and what are the gaps and how can we build on it to be more innovative • Developed some new innovative methodology to develop the impacts of variable Seasonal Climate Forecasting.	Project Leaders Survey (April 2017)
Research	• An integrated economic model taking into account forecast uncertainty for seasonal climate forecast (SCF) value estimation was developed • Economic value of SCF demonstrated for Queensland sugarcane farm case studies of both full and supplementary irrigation management practices.	USQ Quarterly Progress Report (Dec 16-Mar 17)
Industry engagement	Working on two case studies on the value of SCF in irrigation decision making in the sugar and grazing industries: • Interviewed a farmer, industry expert and one academic/expert from each industry • Finished the sugar industry study and are now writing the high level journal impact publication • Still working on the grazing case studies	USQ Quarterly Progress Report (Dec 16-Mar 17) Project Leaders Survey (April 2017)
Collaboration	Collaboration with other projects: • Collaboration with crop modelling project (USQ 7.2) and seasonal forecasting project (USQ 2)	Project Leaders Survey (April 2017)

Palaeoclimate data for water security (*DSITI 16*)

Progress as reported in March 2017 DSITI Quarterly Progress Report: **Partially Achieved**

Activity Type	Details	Source
Research	Research activities undertaken: • Work has been done with an ice core from Antarctica and has shown links between deposits of the ice core and rainfall in Southern parts of QLD • Reconstructed rainfall history for central Lockyer catchment using this core record • Hydrologist is working on stats to determine water security planning - to work out next ten years based on 120 years of data	Project Leaders Survey (April 2017)
Collaboration	Project is a collaboration between experts from Newcastle University and SEQ water • Few issues with collaborative process, everything on track and good relationship with SEQ water Collaboration with other projects: • [Potential] Opportunity to include research in CC projections used by other projects – opportunities for new CC for ARM and communication of climate change	Project Leaders Survey (April 2017)
Research	• Completed reconstruction of a 1000 year rainfall history for Central Lockyer catchment in SEQ based on a range of palaeoclimate data at both station and catchment-scales (Jan 17) ○ Used for the initial drought risk assessment for the catchment ○ Number of decisions that need to be made before this assessment can be finalised (to ensure consistent drought definitions and metrics are used)	DSITI Quarterly Progress Report (Dec 16-Mar 17)
Issues/barriers	Amount of time to sign tricard agreement - a lot of wasted time back and forth •	Project Leaders Survey (April 2017)

APPENDIX 2: BENCHMARKING WEB SURVEY TEMPLATE

DCAP Benchmarking web survey

The purpose of this short survey is to better understand how primary producers and their advisors are currently approaching decisions related to planning for climate variability (season to season; year to year). This benchmarking is important to inform the direction of the Queensland and Northern Australia Drought and Climate Adaptation Program (DCAP) as it seeks to improve the awareness and effectiveness of information and tools to support producers to be more productive and profitable in a variable climate.

DCAP is a Queensland Government initiative to improve producer drought preparedness and resilience. To find out more about DCAP contact Neil Cliffe (neil.cliffe@daf.qld.gov.au) or phone 13 25 23.

(Note: Survey responses will remain anonymous and any personal details provided will not be linked to your response.)

Name (optional):

Region:

- ☐ Far North Queensland
- ☐ North Queensland
- ☐ Mackay, Isaac, Whitsundays
- ☐ Central Queensland
- ☐ Central West Queensland
- ☐ Wide Bay Burnett
- ☐ Darling Downs
- ☐ South West
- ☐ South East: Sunshine Coast
- ☐ South East: Gold Coast
- ☐ North-west and Gulf
- ☐ Barkley
- ☐ Alice Springs
- ☐ VRD
- ☐ Top End
- ☐ Kimberley
- ☐ Pilbara

Respondent role:

- ☐ Producer
- ☐ Service provider/consultant/adviser
- ☐ Extension officer
- ☐ Other _____

Main Industry (may choose more than one):

- Beef
- Dairy
- Sheep
- Horticulture
- Sugar
- Cropping
- Mixed Cropping/Grazing
- Other _____

Do you have a documented plan for managing a variable climate - e.g. a drought plan (or if an advisor, do you have a process to use with your clients)?

- Yes, being implemented
- Yes, will implement when needed
- No, but planning to
- No, I/they don't believe this is necessary
- No, decisions are made as needed
- Not applicable

How confident are you that you are prepared to meet future climate variability, such as droughts or climate change (or if an advisor, to advise clients on preparation)? Please rate on a scale of 0-10 where 0=not at all confident and 10=highly confident.

0 1 2 3 4 5 6 7 8 9 10 NA

How confident are you that you that you have access to the resources/tools/information needed to effectively make planning decisions for climate variability? Please rate on a scale of 0-10 where 0=not at all confident and 10=highly confident.

0 1 2 3 4 5 6 7 8 9 10 NA

Comments:

What (if any) tools/resources are you aware of and which do you use when planning (or assisting clients to plan) for climate variability? (you can choose more than one)

☐ Aware ☐ Use: Rainman/ClimateARM

☐ Aware ☐ Use: CliMate (app store)

☐ Aware ☐ Use: BBSAFE (buy/breed/sell/feed agist evaluator)

☐ Aware ☐ Use: USQ Climate Outlook and Review

☐ Aware ☐ Use: Insuring for weather and climate risks

☐ Aware ☐ Use: VegMachine

☐ Aware ☐ Use: Stocktake/Stocktake Plus

☐ Aware ☐ Use: Will it Rain booklet

☐ Aware ☐ Use: Long Paddock website [if selected – have dropdown menu of the below]

- ☐ SILO
- ☐ Rainfall poster
- ☐ SPOTA-1
- ☐ Forage
- ☐ AussieGRASS
- ☐ SOI Phase system probabilities
- ☐ DSITI climate statement
- ☐ DSITI climate risk matrix assessment
- ☐

☐ Aware ☐ Use: BOM website [if selected – have dropdown menu of the below]

- ☐ POAMA
- ☐ MJO or 40 day wave (Madden Julian Oscillation)
- ☐ ENSO tracker
- ☐

☐ Other seasonal climate forecasts

- ☐ Aware ☐ Use: SST (Sea Surface Temperature) Maps
- ☐ Aware ☐ Use: ECMWF (European Centre for Medium range Weather Forecasting)
- ☐ Aware ☐ Use: IOD (Indian Ocean Dipole)
- ☐ Aware ☐ Use: SAM (Southern Annular Mode)
- ☐ Aware ☐ Use: IRI (International Research Institute for Climate and Society)

☐ Other_____

What climate forecast period/s would be most valuable to you?

- ☐ Rolling 0-3 months
- ☐ Rolling 3-6 months
- ☐ Forthcoming Summer/Winter season
- ☐ Annual 1-2 years
- ☐ Not applicable

Are there any barriers preventing you/your clients from accessing relevant tools/resources and/or knowledge?

- ☐ Yes
- ☐ No

If yes: please indicate the type of barriers

- Lack of time
- Lack of understanding about how to use resources
- Lack of understanding of technologies used in the resources
- Scale and local relevance of products
- Internet access
- Finances
- Access to relevant information
- Access/exposure to relevant technology
- Access to specialised support for relevant technology
- Government support
- Private sector support
- Scepticism about usefulness of products
- Other _____

Comments: _____

Please indicate the key management practices you/your clients use when planning for climate variability (you can choose more than one)

[If industry is Beef, dairy, sheep]

- Carrying capacity
- Adjusting stocking rates according to forage amount and quality
- Adjusting stocking rates (buy, sell, agistment etc.)
- Paddock selection for livestock (e.g. shade, creeks, floodplains etc.)
- Animal segregation, controlled joining or pregnancy testing
- Breeder efficiency
- Setting and analysing business goals, making good business decisions
- Financial risk management
- Property acquisition/sales
- Property planning and land management
- Fencing
- Pasture renovation
- Burning and woody plant management
- Identifying climate change impacts and developing climate change adaptation strategies
- Other:

[If industry is sugar, cropping or horticulture]

- Species selection
- Planting time/season

- Fertilizing/spraying, weed control
- Irrigation
- Harvesting and product processing/management
- Identifying climate change impacts and developing climate change adaptation strategies
- Other:

[*If other industry*]

- Developing a drought management plan
- Identifying climate change impacts and developing climate change adaptation strategies
- Other:

If relevant, could you provide an example of any changes made on farm (whether part of a strategic plan or not) relating to managing for climate variability and the resulting benefits seen/expected to be seen.

Any other comments?

APPENDIX 3: M&E LOG FRAME

Drought Preparedness and Climate Risk Mitigation Project

Program Level M&E Log Frame – (actual projects will vary over life of the project)

[See Page 4 for Project Proposal level Project M&E Plan]

Program levels	Program Projects, Activities & levels	Performance Measures	M&E Methods
Long Term Goal	More resilient and productive primary production able to better plan, adapt and manage drought and climate variability.	Trends in rural industry performance over time in relation to previous performance – especially in the face of extended challenging conditions: • Numbers of enterprises • Productivity • Profitability • Social indicators • Environmental indicators	• ABARES • Other industry statistics • Case studies
End of program Objectives	• Increased scientific capacity and tools to monitor, predict, advise and plan for climate variability and impacts of climate change. • Increased awareness, understanding, skills and capacity of industries and producers to make most effective use of tools and information supporting their management of drought, climate variability and adapt to climate change. • Increased uptake and application by industry, producers and their advisors of available tools, information, practices and strategies to more effectively manage and be productive and profitable in the context of a variable climate.	• Extent of increased scientific capacity and tools available for purpose across the projects – numbers, types, access, reliability, gains in skills and knowledge by researchers. • Extent of gains in awareness, understanding, skills, confidence, access and the extent of use of tools and knowledge, actions within the target industries and producer communities (type, size, locations affected).	• Collated M&E impact data from across participating projects provided in a consistent format and metrics. • Survey/interviews with informed persons and industry representatives re project engagement and impact. • Selected narratives and case studies showing impact of tools, information, training and/or

Program levels	Program Projects, Activities & levels	Performance Measures	M&E Methods
	• Industries and producers seeing clear benefits as a result of using tools and information and making practice changes.	• Actual or indicative costs and benefits arising from use of information and tools. • Barriers and issues emerging through program and projects.	extension on changes made and their benefits. • [ideally, a randomised benchmarking survey of producers in the program/project target zone in relation to their awareness and use of tools and practices – at commencement of project and at intervals/completion.]
Communication & extension projects and activities	Improved drought resilience in western Queensland Business mentoring in Northern Australia • Workshops, distance learning and mentoring to strengthen business management and profitability in variable climates MCV Workshops (incl. risk matrix) • Develop content for the MFC series so that the climate information presented is tailored to the needs and timing of key decisions, engage with key stakeholders to run 10 workshops. Crop production adaptation/modelling under climate change and regional climate change scenario workshops • Detailed biophysical and economic assessment of identified strategies, potential implications and adaptation potential – engaging with producers through workshops Communication and extension activities from development and research projects	• Appropriateness, quality, reach, engagement, access and reactions from participants engaged in extension and communication activities across projects.	• Collated M&E engagement and feedback data from across participating projects provided in a consistent format and metrics. • Questions in other survey/interview cross-project activities. • [Annual] Interviews/surveys with project leaders
Products and Tools	Types of tools developed: Understanding underlying science Tools for education and training	• Number, type, purpose, appropriateness, accuracy, rigour, quality, user-friendliness and accessibility of products and tools developed.	• Reports from projects. • Evidence of peer and user review and testing • Feedback from questions on surveys, interviews or feedback forms

Program levels	Program Projects, Activities & levels	Performance Measures	M&E Methods
	Tools for industry or producers to use for planning and actions		• [Annual] Interviews/surveys with project leaders
Development projects and Activities	Developing products for use in managing climate variability e.g. drought index, improved crop models • Develop early warning drought index, and improved crop yield/production forecasts using an integrated climate and multi-crop model approach – engaging with producers through…. PastureWatch • Provide an email based drought condition alert system to provide timely prompts to producers for input into planning and decision making. Upgrading old decision support • Australia's Variable Rainfall poster, Australia's Variable Pasture Growth poster, Will it Rain?, BBSAFe LongPaddock Upgrade	• Extent of development as per plans – completion of trials, pilots, tests and demonstration and results. • Extent of involvement of end-users in development.	• Collated data from across the projects • [Annual] Interviews/surveys with project leaders
Research projects and activities	Social barriers to effective climate risk management. • An understanding of the barrier and strategies to overcome these barriers to improve uptake of climate risk management information and tools Improving seasonal climate forecasts • Identification of existing and/or potential mechanisms and data sources and develop framework to integrate indices into risk management processes Improve the ability of forecasts to predict multi year drought • Establish trial decadal climate modelling process, including skill testing, spatial grid levels for operational use, links to pasture modelling systems Regional climate change projections for NRM regions	• Type, purpose and extent of research as per plans – completion of trials and reports results. • Rigour and reliability • Extent of involvement of end-users in research planning.	• Collated data from across the projects • Evidence of peer review of results • [annual] Interviews/surveys with project leaders

Program levels	Program Projects, Activities & levels	Performance Measures	M&E Methods
	• Provide easy access to a consistent set of the best available high resolution synthetic climate projections data across Queensland for use in biophysical models. Regional climate change adaptation for NRM regions • Undertake series of workshops using the Climate Risk Matrix approach targeted at primary producer's to communicate the risks of climate change and develop adaptation pathways. [extension focus?] Producing a localised weather/climate index for use in multi-peril crop insurance • Develop prototype of locally/industry suitable MPCI insurance products		
Underpinning structures, processes and management	Organisational involvement Overall Management and coordination Advisory and management committees		

Notes: The key to the M&E is to have clear and consistent required annual M&E reporting categories across all projects – where this data is inputed into an on-line system for collation. Projects determine their own individual M&E activities and data management– with some guidance and assistance as needed so they can effectively report against these categories. Only key summary data as per the required categories would be required to be provided to the overall program M&E. Cross-project primary annual data collection in would include: informed person survey; project leader interviews; and ideally a randomised producer survey. Narratives and case studies will be critical in demonstrating progress/impact in the first year as well.

Project Level M&E Planning Table [Example]

The following table is an example of how to specify which methods you will use in your project and when. The actual methods used will depend on type of project, resources and time frame.

Evaluation Tool	Focus	Timing	Responsibility
Project records	Capturing activity and participation information and completion of outputs and milestones	Throughout project life – at milestone reporting times	Project staff
Peer Review	Gaining expert feedback on activities and outputs – either formally (papers) or informally (workshops)	When activities and outputs ready for review	Project leader or output lead author/researcher
Pre-post producer or stakeholder survey	Capturing awareness, attitudes (confidence), skills (competence) and practices of producers/ stakeholders at the start of the project – and then after 3 years.	Run at beginning Run again early 2014	Evaluation consultant
Web survey/interviews of partners and team	Capturing gains in capacity by wider group, feedback on progress, insights into impact and barriers.	Annually	Project leader assisted by consultant
Feedback sheets from field day/stakeholder meetings and activities	Capturing reactions, changes in attitudes, confidence and competence by participants (farmers and consultants) as well as intentions and in some cases changes in practices	At each activity – ensure focused on desired project impacts	Activity leaders to administer Project team to develop
Compiling secondary indicators such as access research products	Linking access of new outputs/tools or products by with key messages and associated practices and activity.	6 monthly – in line with reporting requirements	Project team with assistance of partners
Structured observer feedback	Capturing dynamic and operations with partners	Annually	Nominated team member
Narratives	Recording changes observed in the field by COs and others in relation to desired project outcomes	As practices observed. Reported 6 monthly	Any of project team or associated partners or Eos who observe a change. Proforma provided by project team
In-depth case studies	Providing quantitative examples of actions taken on farm including	Final year of project	Project team – select cases and contract study to be undertaken.

	costs and (potential) benefits.		

Reporting in Project Proposal – [based on above example]

7. Proposed Evaluation Methods and Processes: Including integration with existing DCAP M&E platforms and processes:	**Engagement, activity and output levels:** • Detailed project records and milestone reports • Peer review of papers, reports and outputs • Feedback sheets from workshops/field days/product releases • Interviews with project staff and closely engaged stakeholders **Awareness, uptake and practice levels:** • Statistics from access of website and tool downloads • Interviews with key stakeholders • Pre and post surveys of producers and advisers [or linking in with program level surveys] • Narratives – capturing examples of producers utilising products to make a change or improve management **Impact level:** • 10 case studies – detailed analysis of cases where products are used to document costs and benefits.

Common Evaluation Methods

Method	Details
Assessments from Steering Group, Reference Group or Advisory Group	These groups are intended to provide key stakeholder input and feedback into project or stakeholders, etc – and hence also provide key monitoring and evaluation data. Structured feedback/reflection sessions beyond normal meeting notes can provide rigorous evaluation information.
Literature/ Report interrogation	Gathering known information from other studies, evaluations, reports, project or stakeholders, etc reports and documentation.
Available statistics	Accessed through ABARE, private services, industry figures etc. Often not specific enough for project or stakeholders', etc objectives – but use what has relevance.
Face to face interviews	High cost. Time consuming. Useful for unstructured interviews and with informed persons and/or for understanding the issues to plan surveys. Best if exploring issues and for buy-in. Often not practical in broader contexts.
Telephone Interviews	Medium cost. Time bound – can be undertaken quickly. Can ensure an exact number of respondents. Can use skilled interviewers. Best for semi and structured interviews. Strike rate 50-90%. Issue of privacy for lists and out of date lists.
Web surveys	Low cost. Time bound (can control the cut-off – most responses within 5 days of invitation). Very much like a mail survey – similar response rates (10-60%). Can target specific individuals – and hence randomise. Can encourage higher response rates. Can be used to be sent far and wide for all potential interested parties to provide an input – not random in that case. Can download directly into spreadsheets. Easy to monitor.. Not as useful for the broader community population at this stage.

Mail surveys	Low cost. Time consuming. Problem with mail lists. Low responses – issue of non-respondents. Have to input data from hardcopy sheets. Less intrusive. Can send out far and wide. Best for structured surveys.
Focus groups	Medium cost. Time bound – can be completed in a short time. Semi-structured group interviews. Need 4-5 for rigour. Not 'statistical' but highly valid for measuring attitudes and opinions.
Observation	Ranges from satellite imagery to grids to observers at events. Less intrusive – complements other data.
Reporting Pro-formas / logs	Standard milestone reporting often fails to capture evaluation data. Regular reporting pro-formas can be developed in line with log-frame needs – going beyond standard milestone needs and providing information against log frame levels.
Evaluation workshops / Debriefs	Structured techniques using small groups, discussion, pin-boarding, reflection, scenarios etc.
Event feedback forms	Participant feedback sheets (need to ensure it captures changes in knowledge, skills and intentions for change); Dart Boards; ORIDs etc
Narratives	Brief structured Vignettes/short stories capturing change and or barriers to change as it happens.
Case Studies	Detailed analysis of selected cases to better understand the context and impact of processes.

APPENDIX 4: PROJECT LEADER SURVEY

Respondent Name:

Respondent Project:

1. **What activities have been undertaken in the project (or of which they are aware) – and what is there yet to do?**

2. **What issues have emerged which have impacted on the progress/direction of the project?**

3. **What engagement there has been with industry/stakeholders during the process?**

4. **What collaboration has occurred with other projects in the program – and how has that helped?**

5. **What outputs/new understanding is emerging (/has emerged) from the project which progresses our understanding?**

6. **What are the (potential) benefits and who are/will be the beneficiaries of the project outcome?**

7. **What plans are there to utilise/extend with others to ensure that the benefits are realised?**

APPENDIX 5: INFORMED PERSONS QUESTIONS

Respondent Name:

Respondent Project:

1. **What has been your involvement/role within the DCAP program and how satisfied have you been with this level of input?**

2. **What are your assessments of relevance of the program overall and …. In terms of how these projects will add value to what is already 'out there'/available**?

3. **How well have the projects and the program progressed from your point of view what has helped and hindered? – any issues?**

4. **What has come out of the program to date that has been particularly interesting/useful/beneficial?**

5. **Overall, what are the benefits that might result – for individuals and more generally the industry**?

6. **What needs to be done to ensure that those who need this information/tool/output are aware of it and able to effectively use and apply it?**

7. **Any other comments about the project**.

APPENDIX 6: BENCHMARKING WEB SURVEY PRELIMINARY RESULTS

Demographics

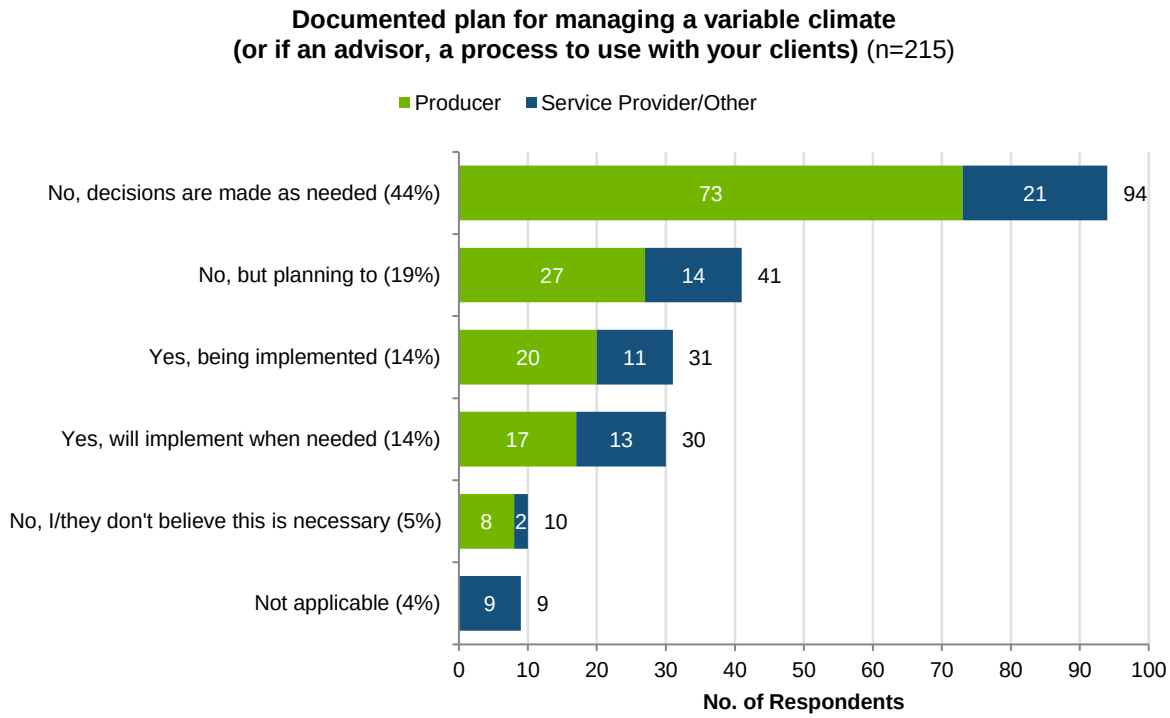
As of 29th May 2017 there were **215 valid responses** to the benchmarking survey.

- 67% of respondents were Producers and 33% Service Providers/Other
- Main three industry combinations of the 145 producer respondents:
    - 68% Beef/Dairy/Sheep only
    - 13% Sugar/Cropping/Horticulture only
    - 11% Beef/Dairy/Sheep & Sugar/Cropping/Horticulture
- Main three industry combinations of the 70 Service Provider/Other respondents:
    - 54% Beef/Dairy/Sheep only
    - 23% Beef/Dairy/Sheep & Sugar/Cropping/Horticulture
    - 13% Sugar/Cropping/Horticulture only
- 89% of respondents were from Queensland – the top five regions represented: Central Queensland (17%), Wide Bay Burnett (11%), Darling Downs (11%), Mackay/Isaac/Whitsundays (8%), and Far North Queensland (8%)

Responses

Documented plan for managing a variable climate

The majority of respondents (68%) did not have a documented plan (or process to use) for managing a variable climate, with 44% of total respondents indicating *decisions are made as needed*, 19% intending to have a documented plan in future, and 5% not believing it was necessary.



Confidence in preparedness to meet future climate variability

Overall respondents were moderately confident in their preparedness to meet future climate variability (6.4 avg.), with Producers (6.4 avg.) slightly more confident than Service Provider/Other (6.1 avg.) respondents were in their ability to advise clients on preparation.

(Note: Question was asked as 0-10 rating scale where 0=not at all confident and 10=highly confident)

Confidence in ability to access resources/tools/information needed to effectively make planning decisions for climate variability

Overall respondents were moderately confident in the ability to access resources/tools/information needed to effectively make planning decisions for climate variability (6.1 avg.), with only a negligible difference between Producer (6.0 avg.) and Service Provider/Other (6.1 avg.) confidence.

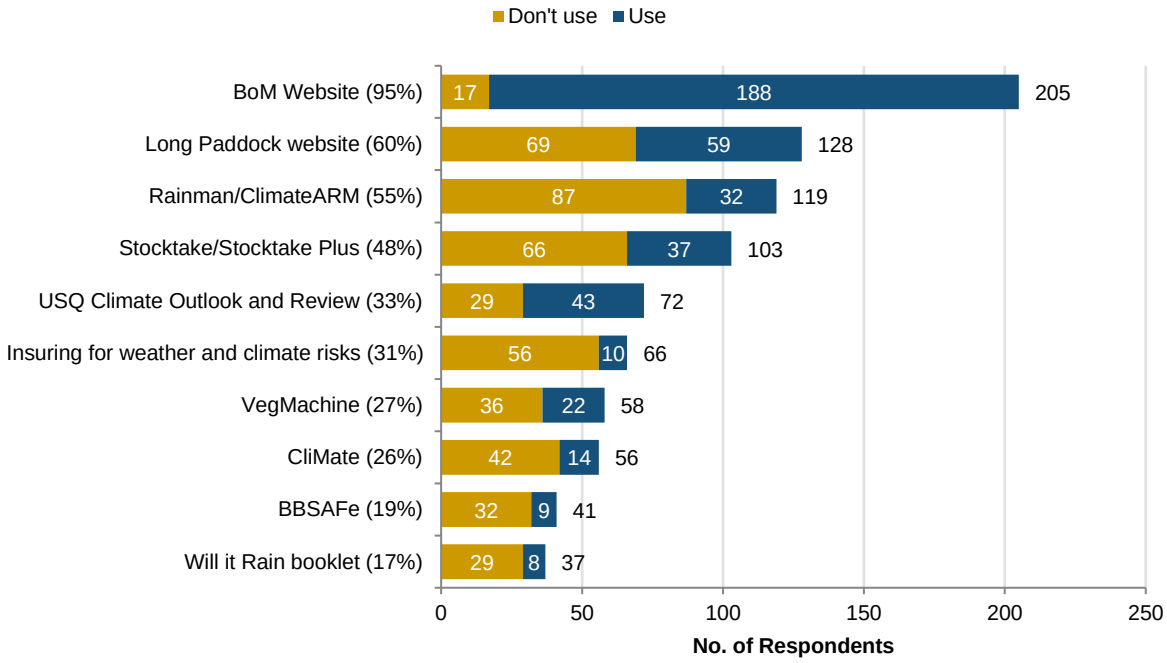
(Note: Question was asked as 0-10 rating scale where 0=not at all confident and 10=highly confident)

Awareness/use of tools used when planning for climate variability

Tools/Resources

- The BoM Website was by far the most well-known and used resource when planning (or assisting clients plan) for climate variability, with a 95% overall awareness and 87% usage rate.
    - Of the 188 respondents who used the BoM website: 68% used *ENSO tracker*, 55% *MJO or 40 day wave*, and 30% *POAMA*.
    - Of the 59 respondents who used the LongPaddock Website: 64% used *SOI Phase system rainfall probabilities*, 41% *Forage*, 41% *Rainfall poster,* 25% *SILO*, 22% *AussieGRASS*, and 14% both *SPOTA-1* and *DSITI Climate Risk Matrix Assessment.*
- Tools/resources that Service Providers/Others were noticeably more likely to use compared to Producers included: *LongPaddock Website* (41% vs. 21%), *VegMachine* (24% vs. 14%), and *Rainman/ClimateARM* (26% vs. 10%).

Overall awareness and use of tools/resources (n=215)



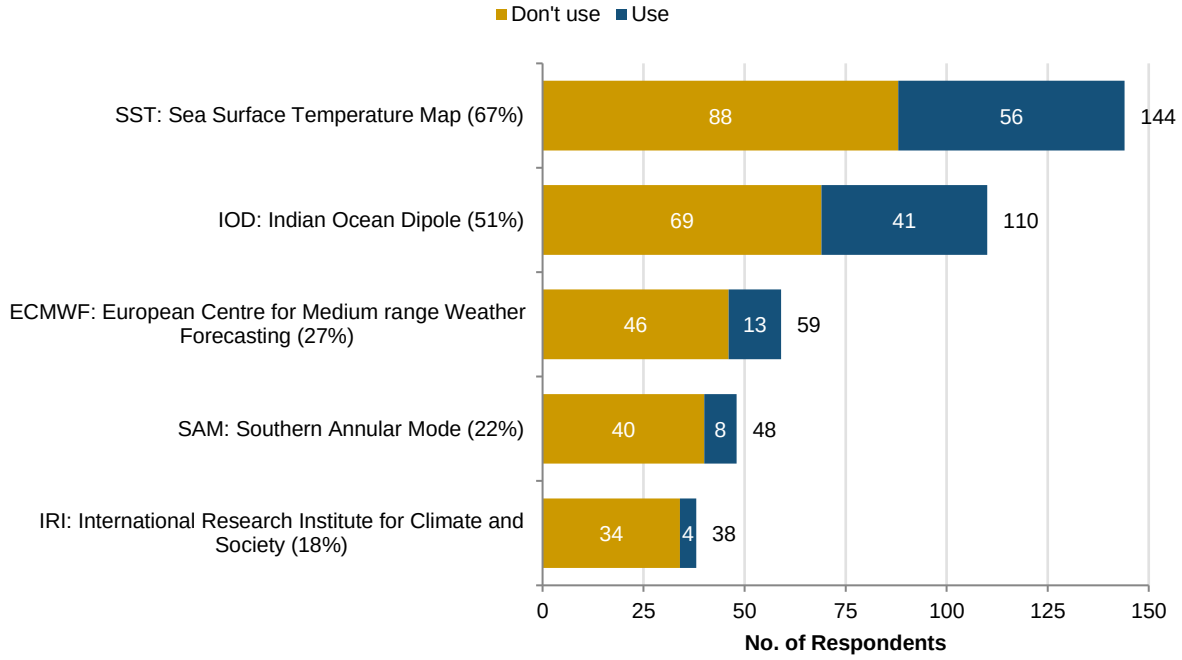
Tool/Resource	Aware but don't use	Use	Overall Awareness
BoM Website	8%	87%	95%
Long Paddock website	32%	27%	60%
Rainman/ClimateARM	40%	15%	55%
Stocktake/Stocktake Plus	31%	17%	48%
USQ Climate Outlook and Review	13%	20%	33%

Insuring for weather and climate risks	26%	5%	31%
VegMachine	17%	10%	27%
CliMate (app store)	20%	7%	26%
BBSAFe (buy/breed/sell/feed agist evaluator)	15%	4%	19%
Will it Rain booklet	13%	4%	17%

Other Seasonal Climate Forecasts

The two most well-known seasonal climate forecasts were *SST: Sea Surface Temperature Map* (67%) and *IOD: Indian Ocean Dipole* (51%), with 26% of total respondents using *SST* and 19% using *IOD.* There were no prominent differences between Producer and Service/Provider awareness and usage of other seasonal climate forecasts.

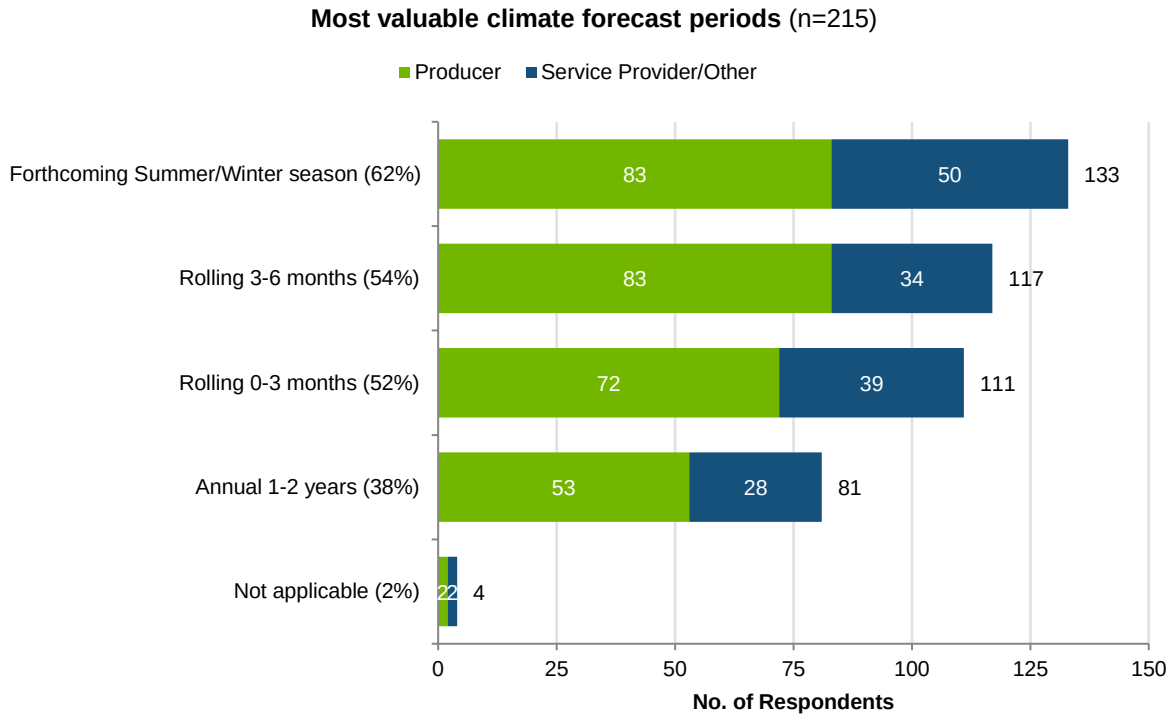
Overall awareness and use of other seasonal climate forecasts (n=215)



Forecast	Aware but don't use	Use	Overall Awareness
SST (Sea Surface Temperature) Map	41%	26%	67%
IOD (Indian Ocean Dipole)	32%	19%	51%
ECMWF (European Centre for Medium range Weather Forecasting)	21%	6%	27%
SAM (Southern Annular Mode)	19%	4%	22%
IRI (International Research Institute for Climate and Society)	16%	2%	18%

Most valuable climate forecast periods

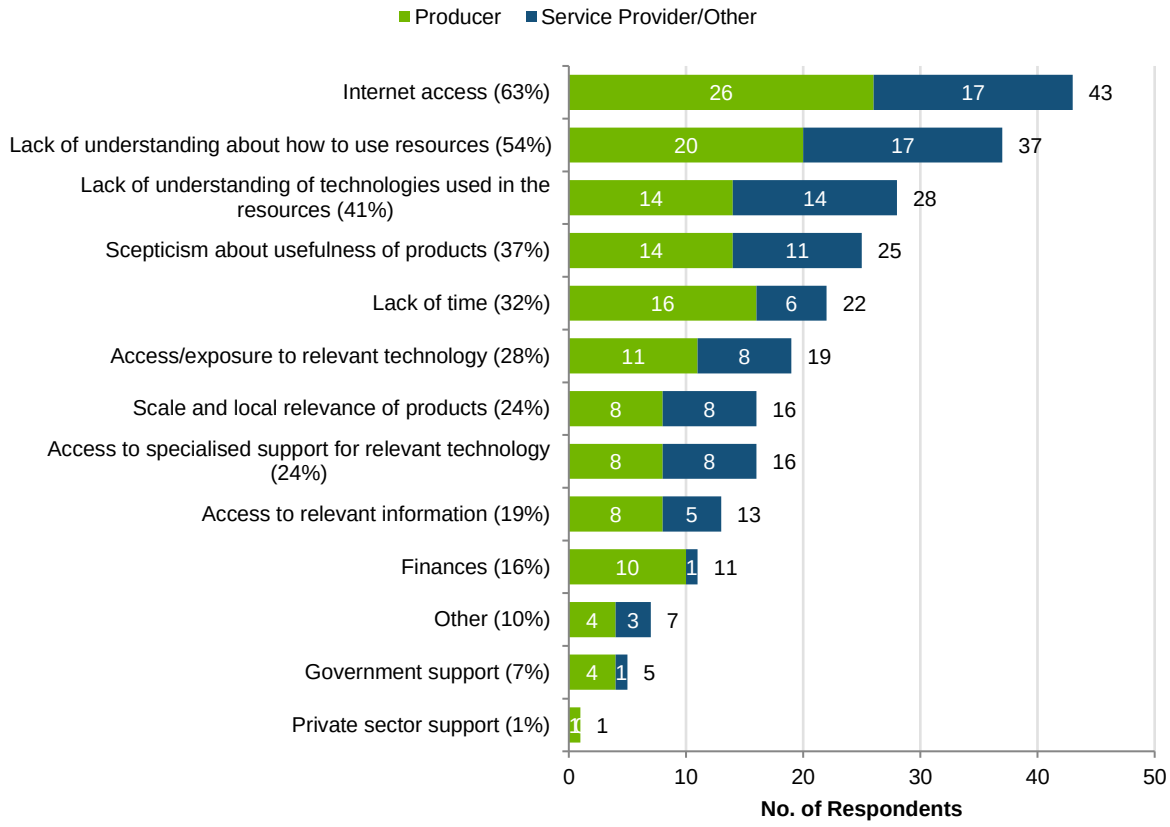
Forthcoming Summer/Winter season (62%) was the most selected climate forecast period that respondents saw as valuable, followed by *Rolling 3-6 months* (54%), *Rolling 0-3 months* (52%), and *Annual 1-2 years* (38%).



Barriers preventing access to relevant tools/resources and/or knowledge

Only around a third of respondents believed there were barriers preventing them (or their clients) accessing relevant tools/resources and/or knowledge. The top five barriers indicated by these 68 respondents (44 Producers and 24 Service Provider/Other) were: *Internet access* (63%*); Lack of understanding about how to use resources* (54%); *Lack of understanding of technologies used in the resources* (41%); *Scepticism about usefulness of products* (37%); and *Lack of time* (32%).

Barriers preventing access to relevant tools/resources and/or knowledge
(n=68)



Key management practices used when planning for climate variability

The top five key management practices used (or clients used) when planning for climate variability by industry were:

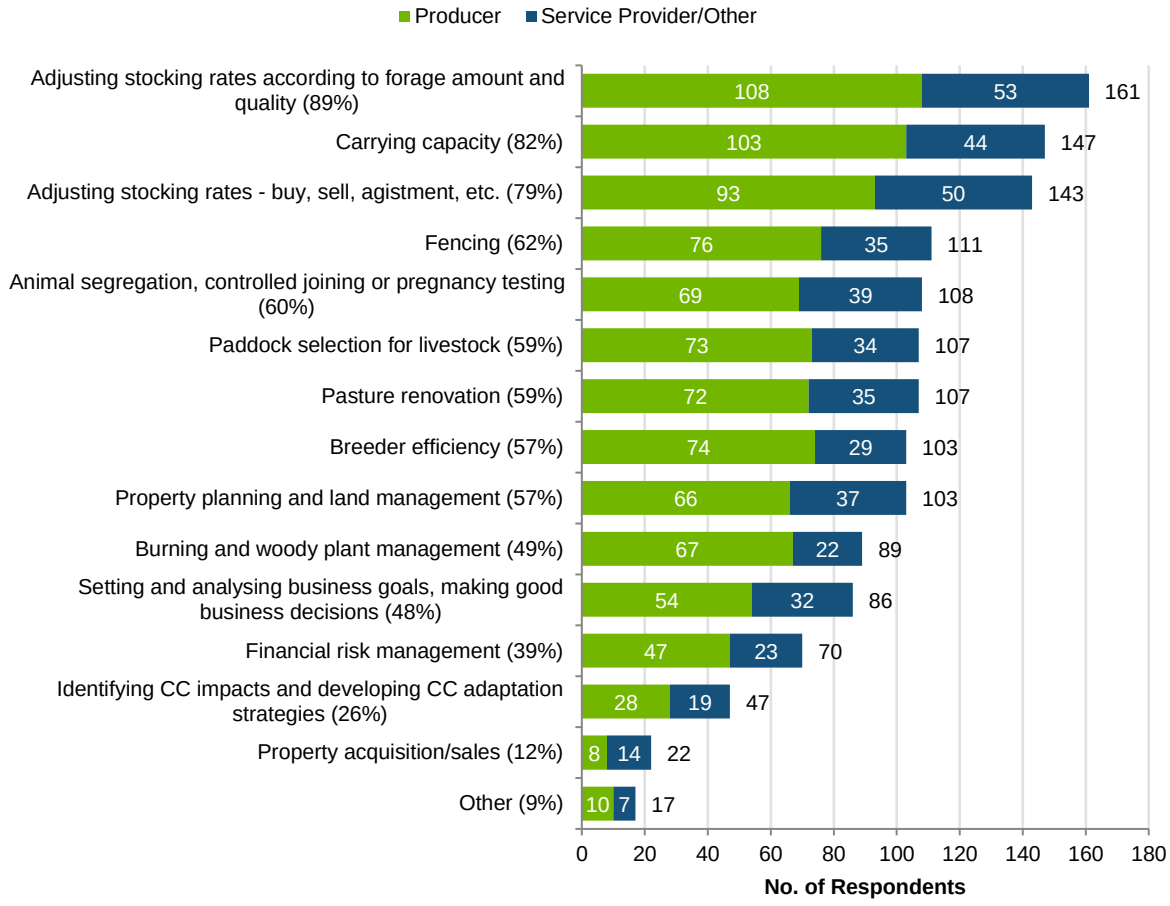
- **Beef/Dairy/Sheep:**
  - Adjusting stocking rates according to forage amount and quality (89%)
  - Carrying capacity (82%)
  - Adjusting stocking rates - buy, sell, agistment, etc. (79%)
  - Fencing (62%)
  - Animal segregation, controlled joining or pregnancy testing (60%)
- **Sugar/Cropping/Horticulture:**
  - Planting time/season (79%)
  - Fertilizing/spraying, weed control (72%)
  - Irrigation (51%)

- Species selection (48%)
- Harvesting and product processing/management (46%)

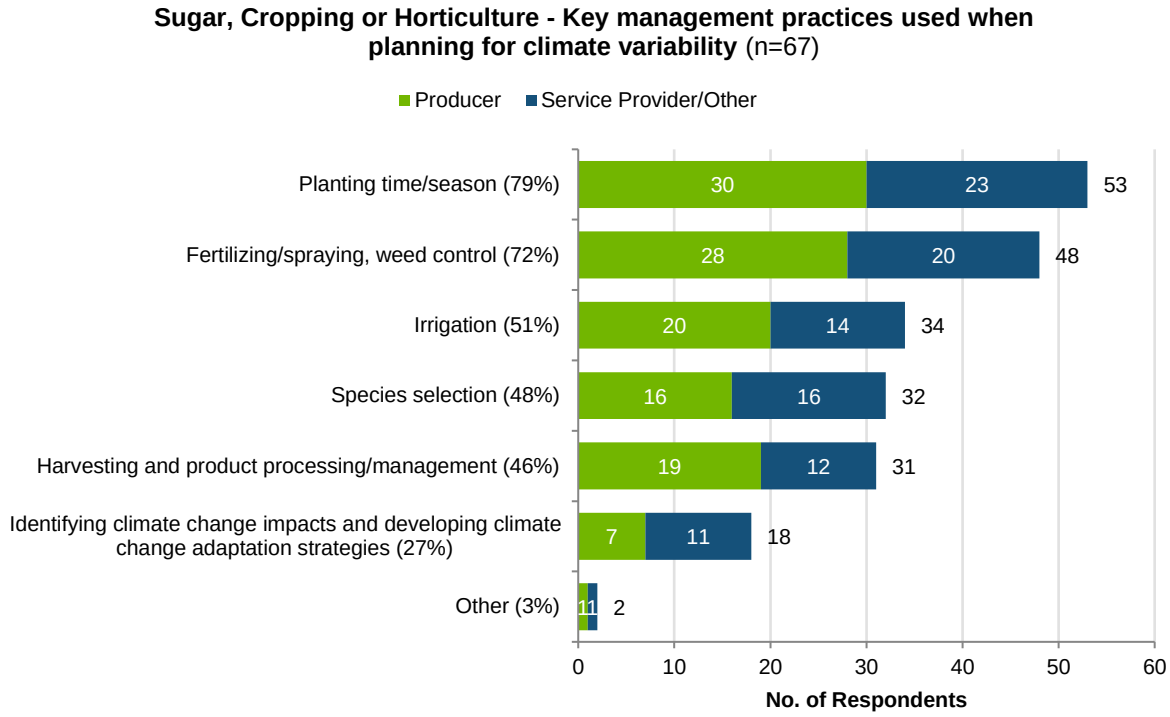
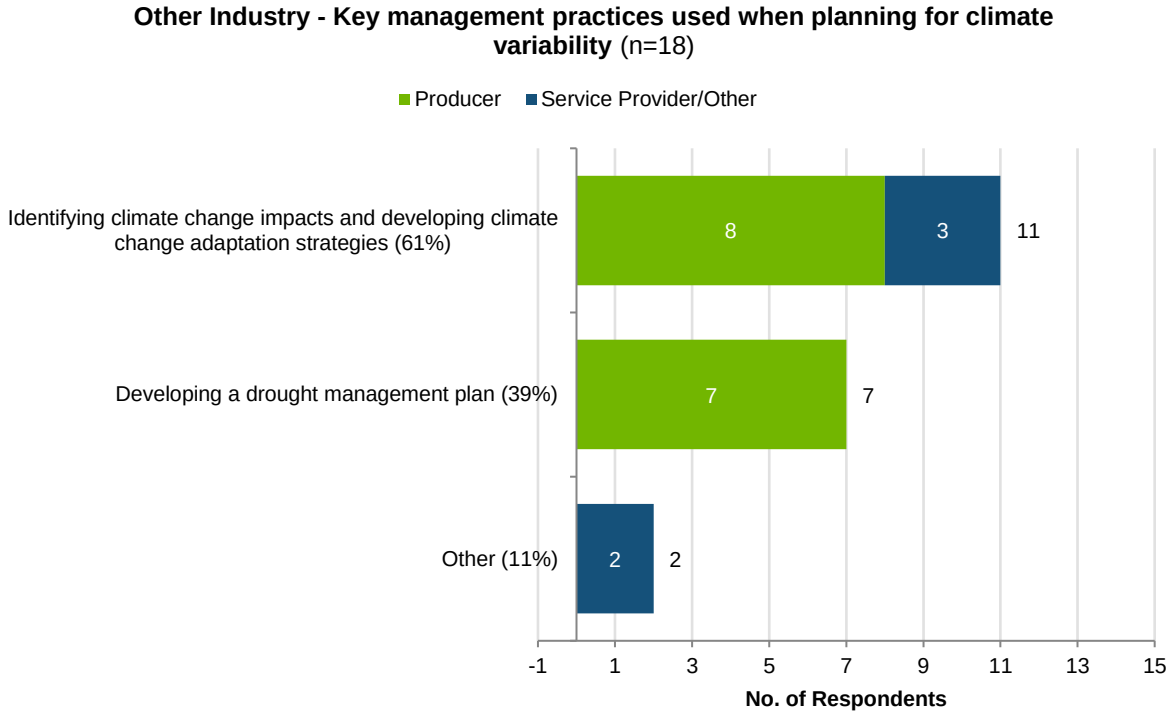
- **Other Industry (only 3 options provided):**
  - Identifying climate change impacts and developing climate change adaptation strategies (61%)
  - Developing a drought management plan (39%)
  - Other (11%)

Beef/Dairy/Sheep

Beef, Dairy or Sheep - Key management practices used when planning for climate variability (n=180)



Sugar/Cropping/Horticulture



Other Industry